US 20030180749A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2003/0180749 A1**

Koster et al. (43) **Pub. Date: Sep. 25, 2003**

(54) **METHODS FOR GENERATING DATABASES AND DATABASES FOR IDENTIFYING POLYMORPHIC GENETIC MARKERS**

(76) Inventors: **Hubert Koster**, La Jolla, CA (US); **Andreas Braun**, San Diego, CA (US); **Dirk Van Den Boom**, Hamburg (DE); **Ping Yip**, San Diego, CA (US); **Charlie Rodi**, Del Mar, CA (US); **Liyan He**, San Diego, CA (US); **Norman Chiu**, San Diego, CA (US); **Christian Jurinke**, Hamburg (DE)

Correspondence Address:
Stephanie Seidman
Heller Ehrman White & McAuliffe LLP
7th Floor
4350 La Jolla Village Drive
San Diego, CA 92122 (US)

(21) Appl. No.: **10/273,321**

(22) Filed: **Oct. 15, 2002**

Related U.S. Application Data

(60) Division of application No. 09/687,483, filed on Oct. 13, 2000.
Continuation-in-part of application No. 09/663,968, filed on Sep. 19, 2000.

(60) Provisional application No. 60/217,658, filed on Jul. 10, 2000. Provisional application No. 60/159,176, filed on Oct. 13, 1999. Provisional application No. 60/217,251, filed on Jul. 10, 2000.

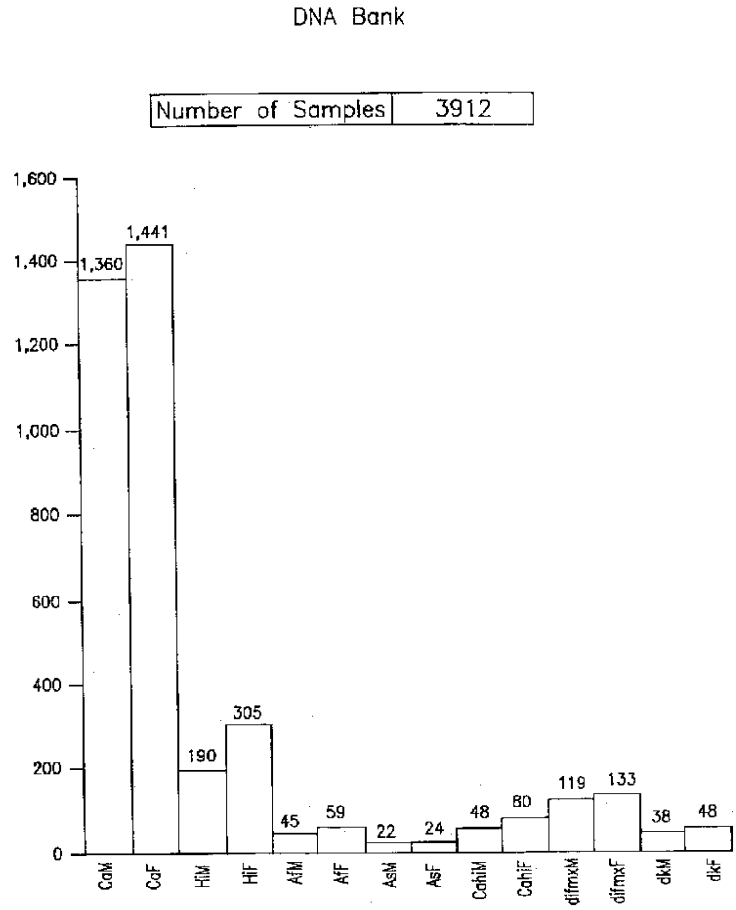
Publication Classification

(51) **Int. Cl.**[7] **C12Q 1/68**; G06F 19/00; G01N 33/48; G01N 33/50

(52) **U.S. Cl.** **435/6**; 702/20

(57) **ABSTRACT**

Processes and methods for creating a database of genomic samples from healthy human donors, methods that use the database to identify and correlate polymorphic genetic markers and other markers with diseases and conditions are provided.



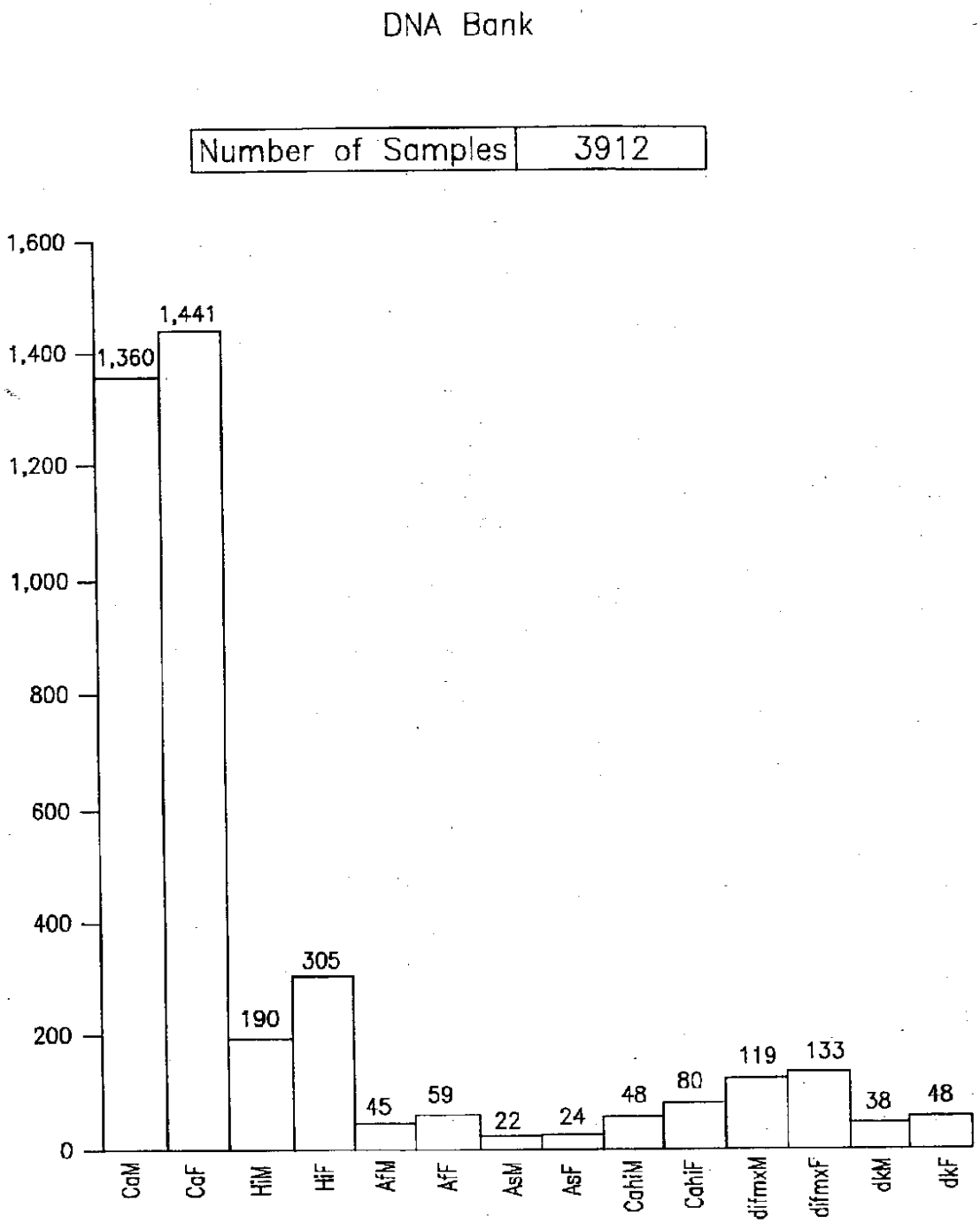

DNA Bank
Number of Samples 3912
1,600
1,400
1,200
1,000
800
600
400
200
0
1,360
1,441
190
305
45
59
22
24
48
80
119
133
38
48
CaM
CaF
HiM
HiF
AfM
AfF
AsM
AsF
CahiM
CahiF
difmxM
difmxF
dkM
dkF

FIG. IA

Caucasians

Number of Samples	2801

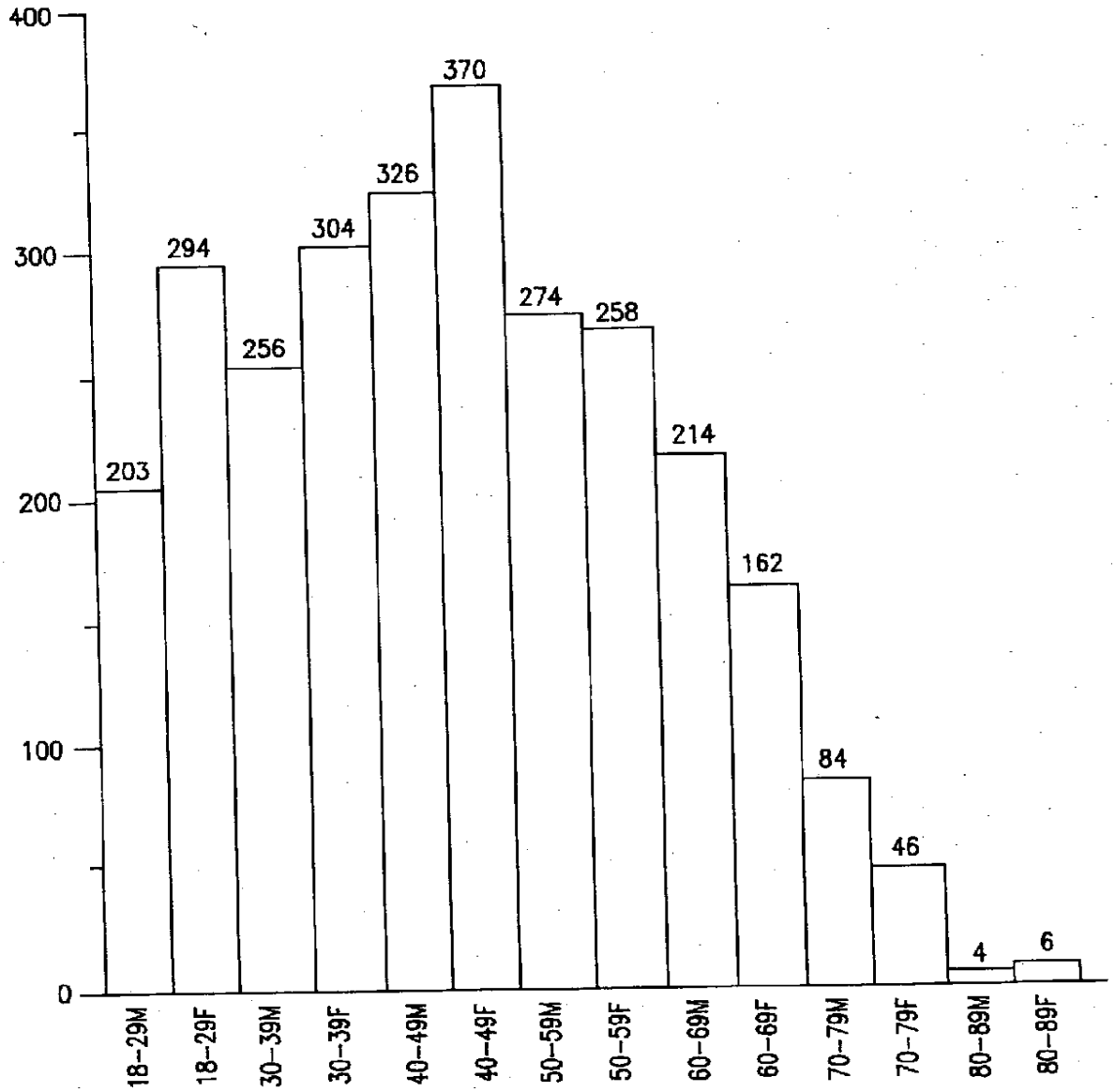


FIG. 1B

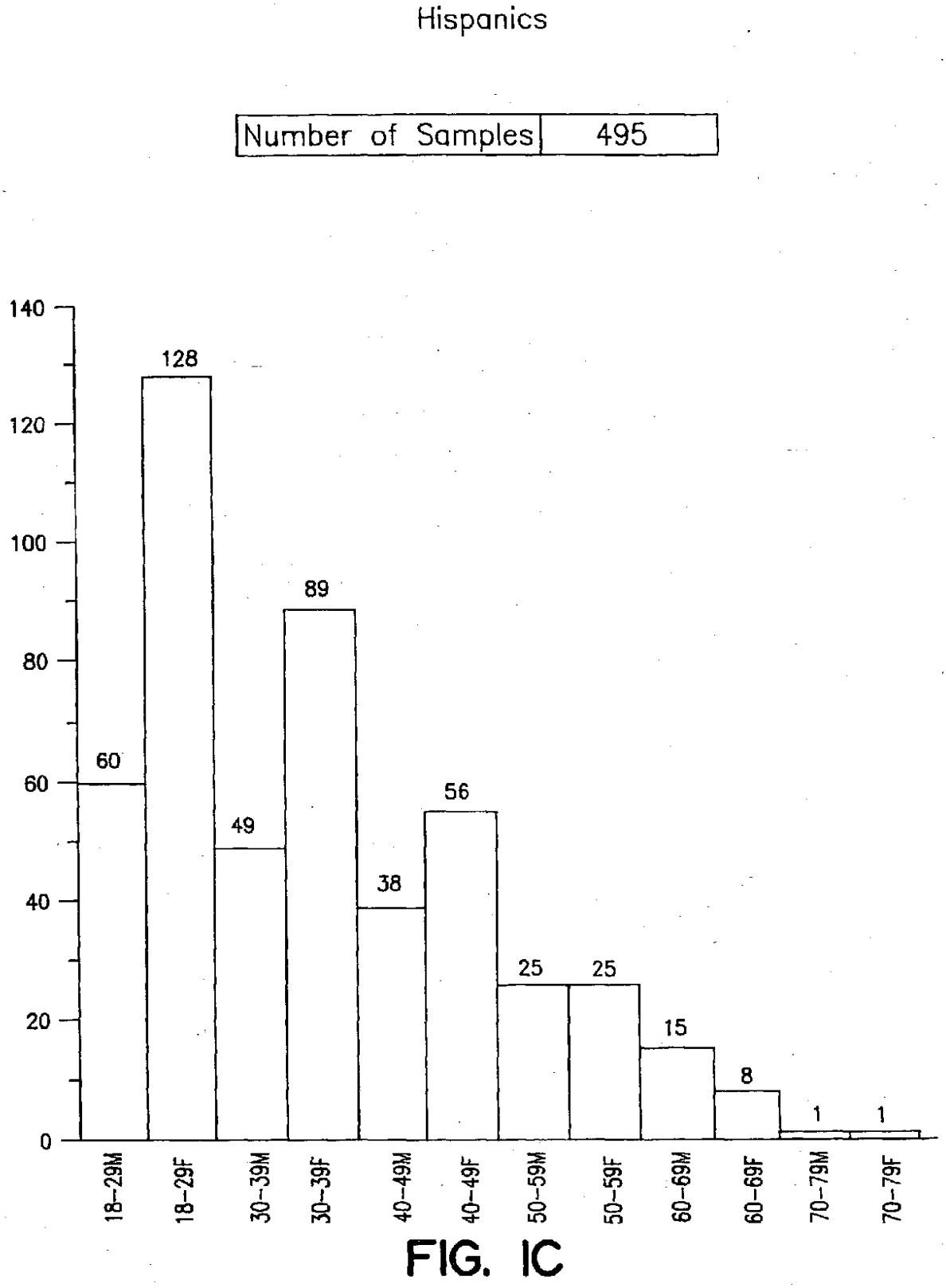
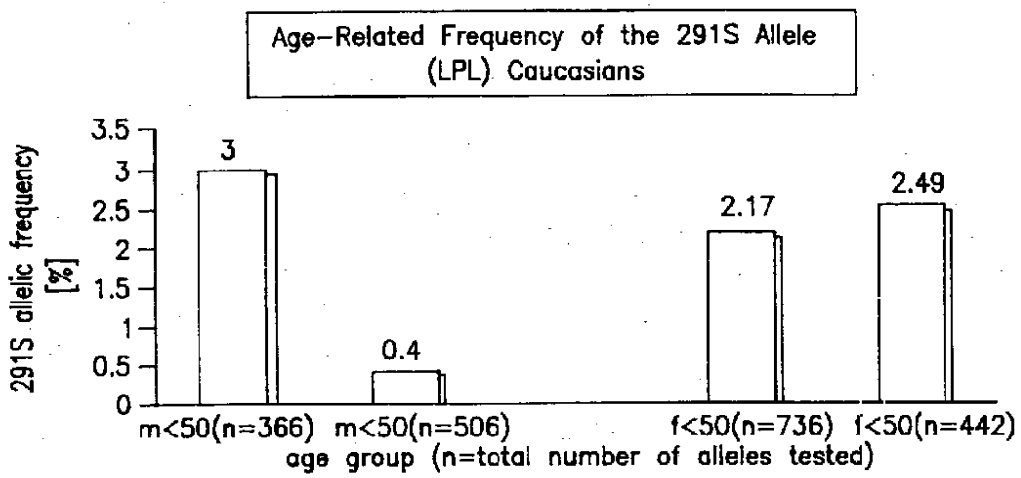
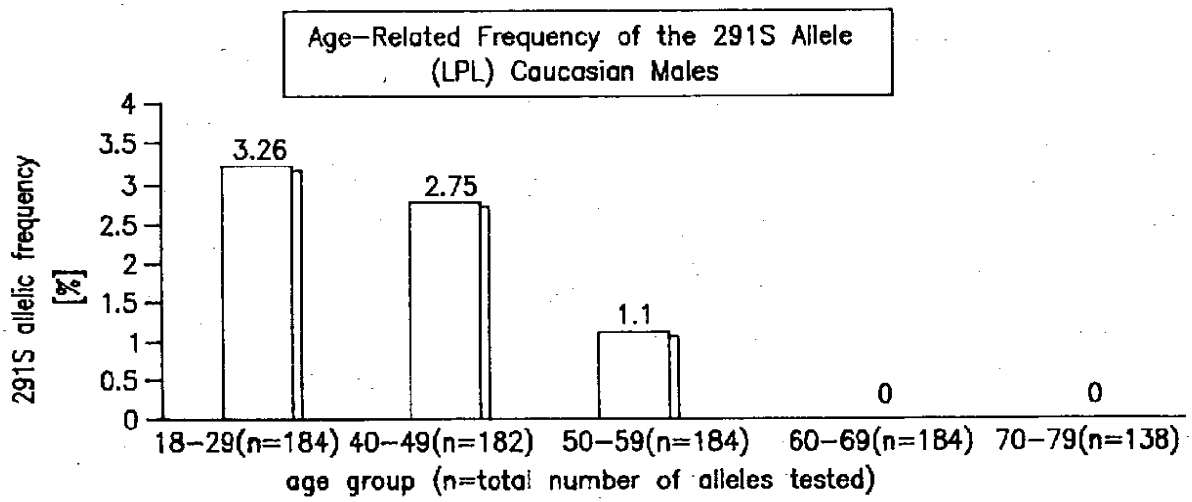

Hispanics
Number of Samples 495
140
120
100
80
60
40
20
0
60
128
49
89
38
56
25
25
15
8
1
1
18–29M
18–29F
30–39M
30–39F
40–49M
40–49F
50–59M
50–59F
60–69M
60–69F
70–79M
70–79F

FIG. IC



age– and sex–distribution of the 291S allele of the lipoprotein lipase gene. A total of 436 males and 586 females were investigated.

FIG. 2A



Age– related distribution of the 291S allele of the lipoprotein lipase gene within the male Caucasian population. A total of 436 males were tested.

FIG. 2B

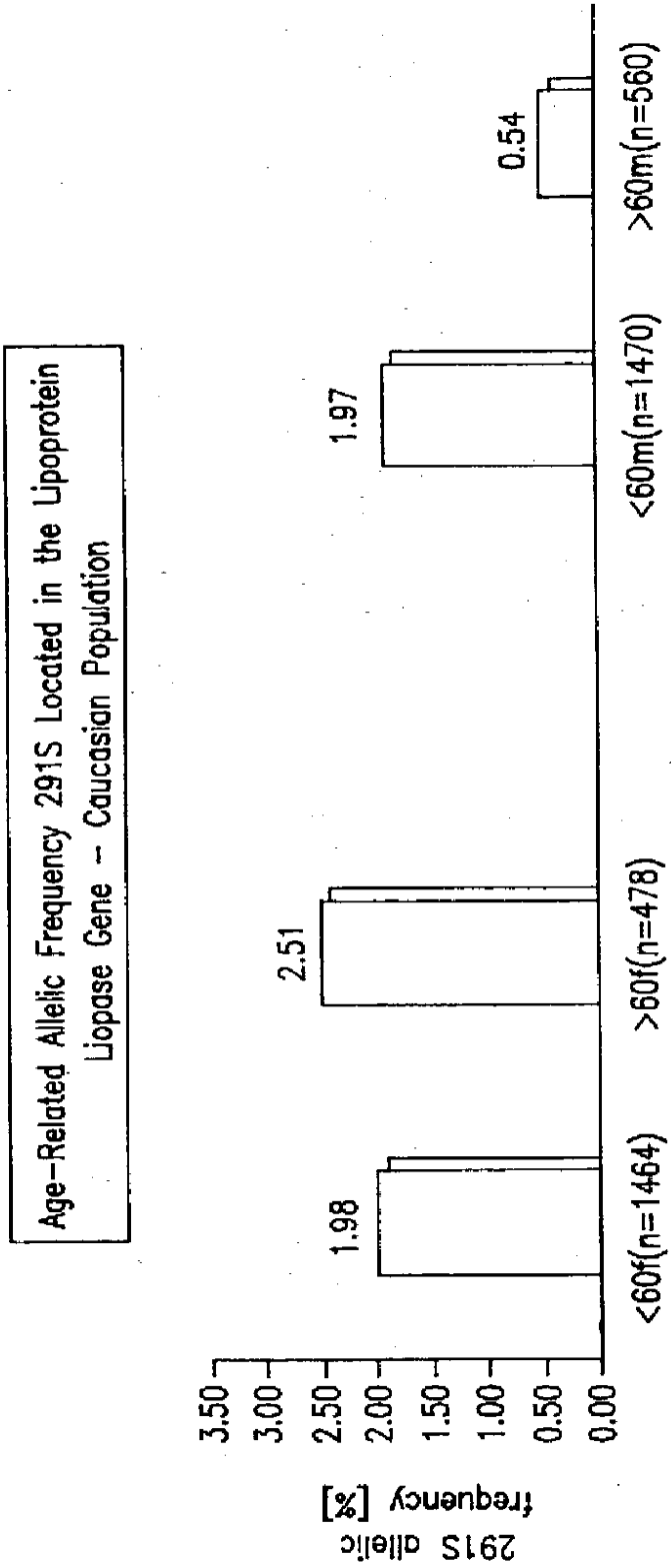

Age-Related Allelic Frequency 291S Located in the Lipoprotein Lipase Gene – Caucasian Population
291S allelic frequency [%]
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1.98
2.51
1.97
0.54
<60f(n=1464)
>60f(n=478)
<60m(n=1470)
>60m(n=560)
age groups (n=total number of alleles tested)
Significance: Allele frequency of Ser291 drops from 1.97% to 0.54% in males; p=0.009

FIG. 2C

Questionnaire for
Population-Based
Sample Banking

Data Collection Form

Affix Barcode Here

Collection Information

Consent Form Signed Yes No
Date of Collection (MM/DD/YY)__/__/98
Time of Sample Collection(nearest hour in 24 hour clock format)_____
Initials of Data Collector_____Collecting Agency_____
(DO NOT COMPLETE: (For Date Entry Only)Sample_____intact_____lost _____broken

Donor information

Sex: ☐ Male ☐ Female Date of Birth (MM/YY)__/__
In which state do you live? _____ How long have you lived there ? _____ Years
What is your highest grade you completed in school?

☐ less than 8th grade ☐ 8th,9th,10th or 11th grade ☐ high school graduate or equivalency
☐ some college 2 yr degree ☐ college graduate 4 yr degree ☐ post graduate education or degree

To the best of your knowledge what is the Ethnic Origin of your:

Father	Mother	
☐	☐	Caucasian (please check specific geographic area below if known)
☐	☐	Northern Europe (Austria,Denmark,Finland,France,Germany,Netherlands,Norway,Sweden,Switzerland,U.K.)
☐	☐	Southern Europe (Greece,Italy,Spain)
☐	☐	Eastern Europe (Czechoslovakia,Hungary,Poland,Russia,Yugoslavia)
☐	☐	Middle Eastern (Israel,Egypt,Iran,Iraq,Jordan,Syria, other Arab States)
☐	☐	African-American
☐	☐	Hispanic (please check specific geographic area below if known)
☐	☐	Mexico
☐	☐	Central America,South American
☐	☐	Cuba,Puerto Rico, other Caribbean
☐	☐	Asian (please check specific geographic area below if known)
☐	☐	Japanese
☐	☐	Chinese
☐	☐	Korean
☐	☐	Vietnamese
☐	☐	other Asian
☐	☐	Other _____
☐	☐	Don't know

Health information: Have you or has anyone in your immediate family(parents,brothers,sisters, or your children) had the following? Check all that apply

Disease:	You	Mother	Father	Sister	Brother	Child
Heart Disease Stroke or Arteriosclerosis						
Cancer (Specify type if known)						
Alzheimer's Disease or Dementia						
Chronic inflammatory or Autoimmune Disease						
Nervous System Disease like Multiple Sclerosis						
Other (please specify)						

Additional health information details you would like to provide:

_____

FIG. 3

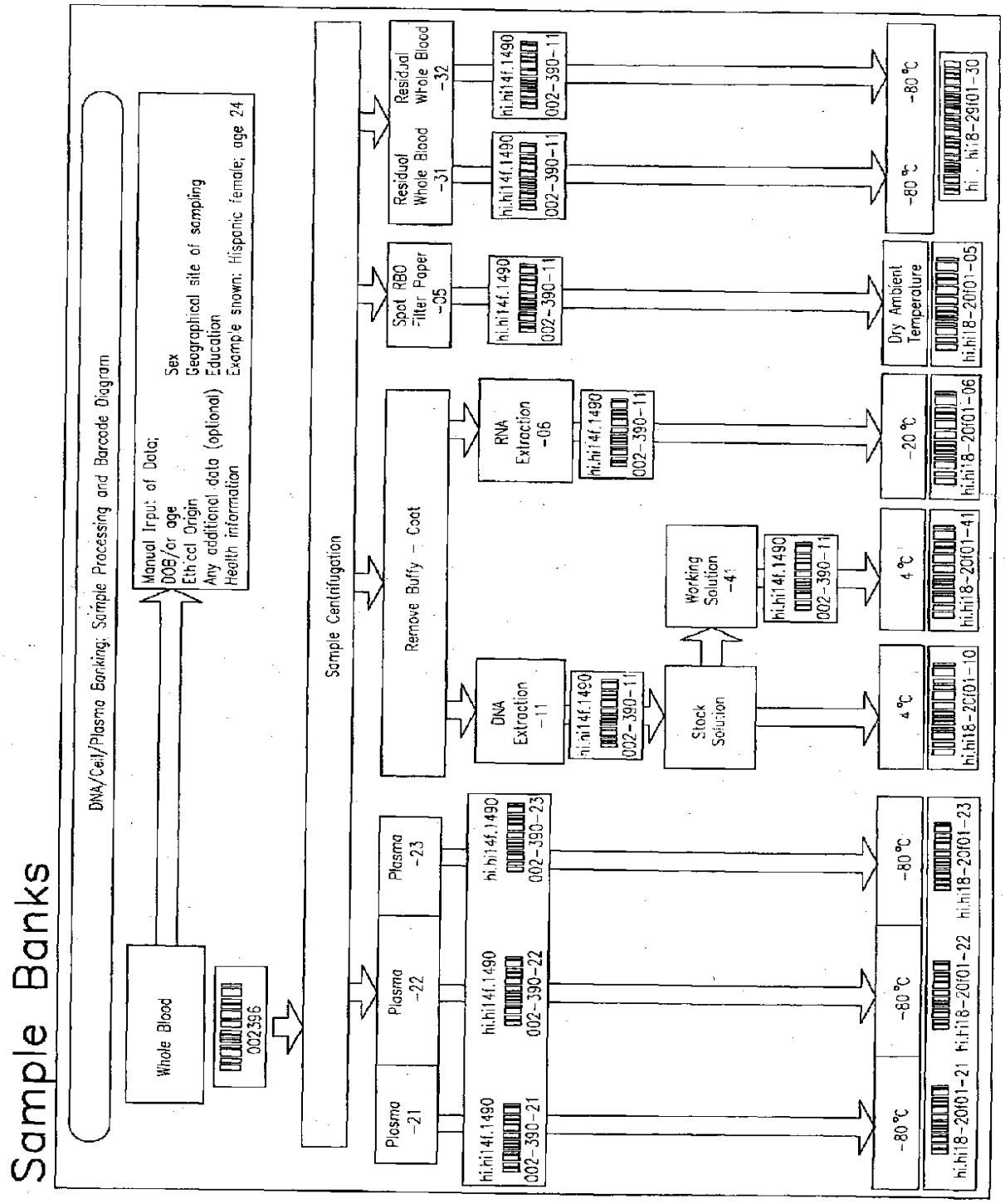

Sample Banks
DNA/Cell/Plasma Banking; Sample Processing and Barcode Diagram
Whole Blood
002396
Manual Input of Data;
DOB/or age
Ethnic Origin
Any additional data (optional)
Health information
Sex
Geographical site of sampling
Education
Example shown: Hispanic female; age 24
Sample Centrifugation
Plasma -21
Plasma -22
Plasma -23
hi.hi14f.1490 002-390-21
hi.hi14f.1490 002-390-22
hi.hi14f.1490 002-390-23
-80 °C
hi.hi18-20f01-21
hi.hi18-20f01-22
hi.hi18-23f01-23
Remove Buffy - Coat
DNA Extraction -11
RNA Extraction -06
Stock Solution
Working Solution -41
4 °C
hi.hi18-20f01-10
hi.hi18-20f01-41
-20 °C
hi.hi18-20f01-06
Spot RBC Filter Paper -05
Residual Whole Blood -31
Residual Whole Blood -32
Dry Ambient Temperature
hi.hi18-20f01-05
hi.hi18-29f01-30

FIG. 4

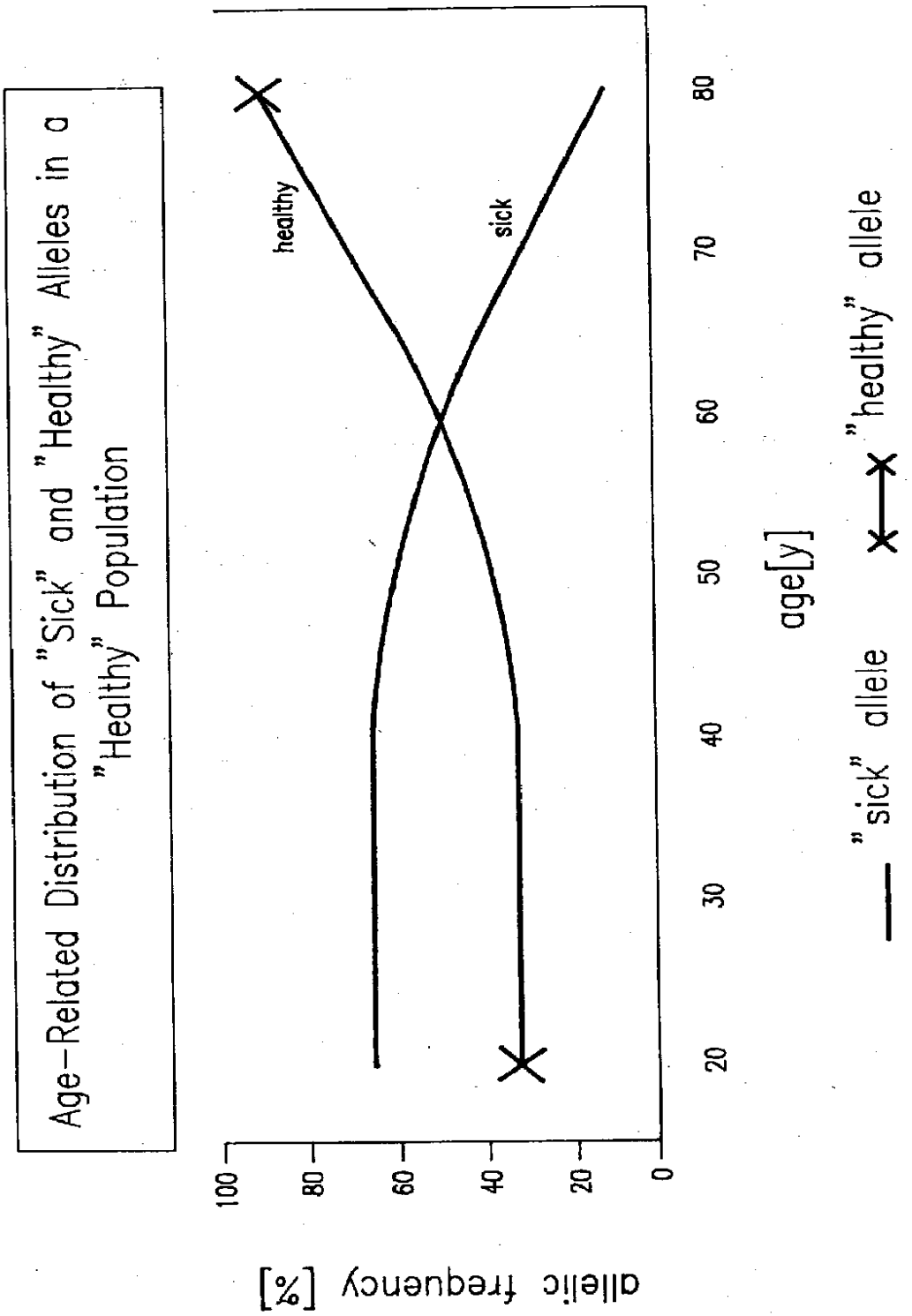

Age-Related Distribution of "Sick" and "Healthy" Alleles in a "Healthy" Population
healthy
sick
allelic frequency [%]
100
80
60
40
20
0
20
30
40
50
60
70
80
age[y]
"sick" allele
"healthy" allele

FIG. 5

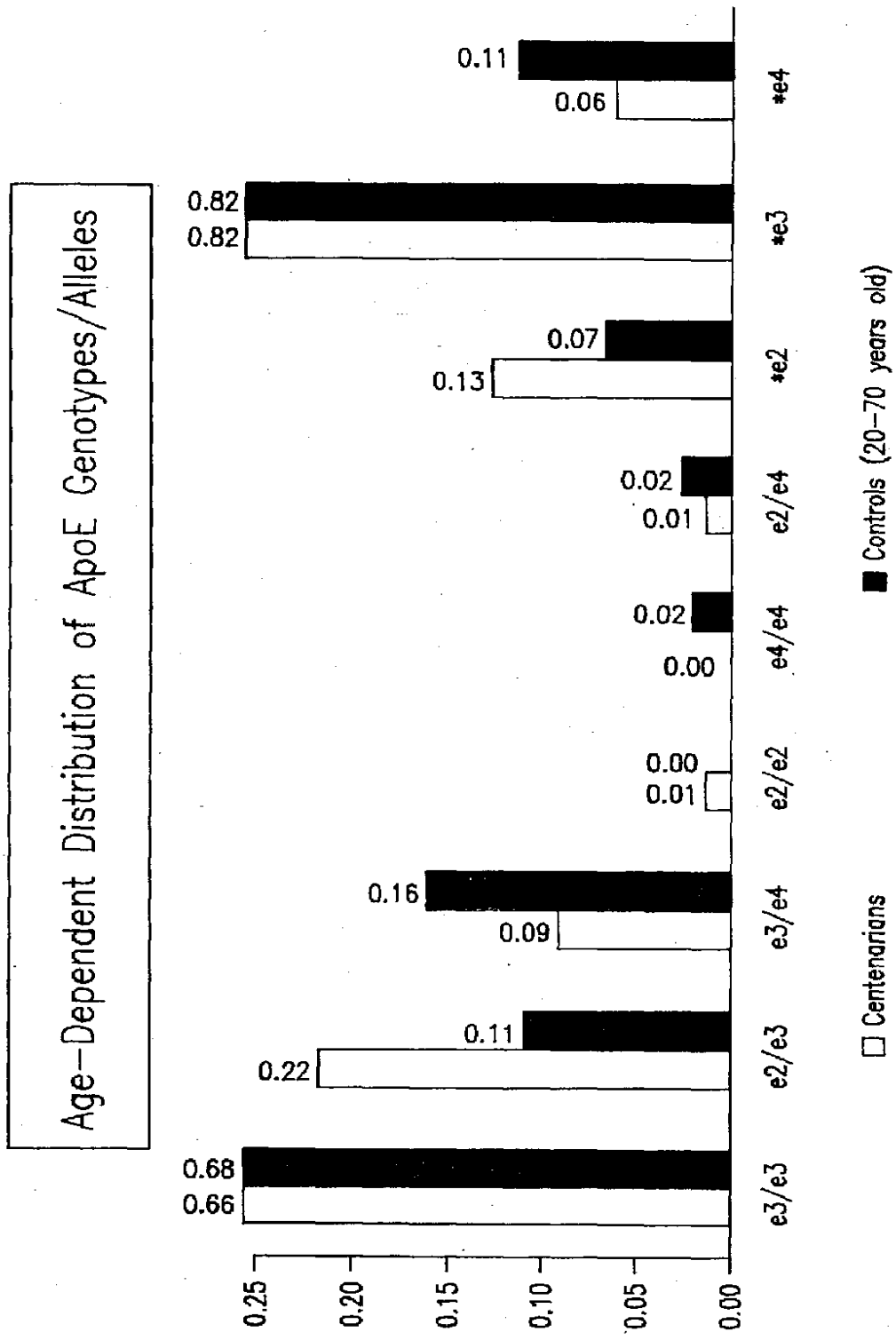

Age-Dependent Distribution of ApoE Genotypes/Alleles
0.11
0.06
*e4
0.82
0.82
*e3
0.07
0.13
*e2
0.02
0.01
e2/e4
0.02
0.00
e4/e4
0.00
0.01
e2/e2
0.16
0.09
e3/e4
0.11
0.22
e2/e3
0.68
0.66
e3/e3
0.25
0.20
0.15
0.10
0.05
0.00
Controls (20-70 years old)
Centenarians

FIG. 6

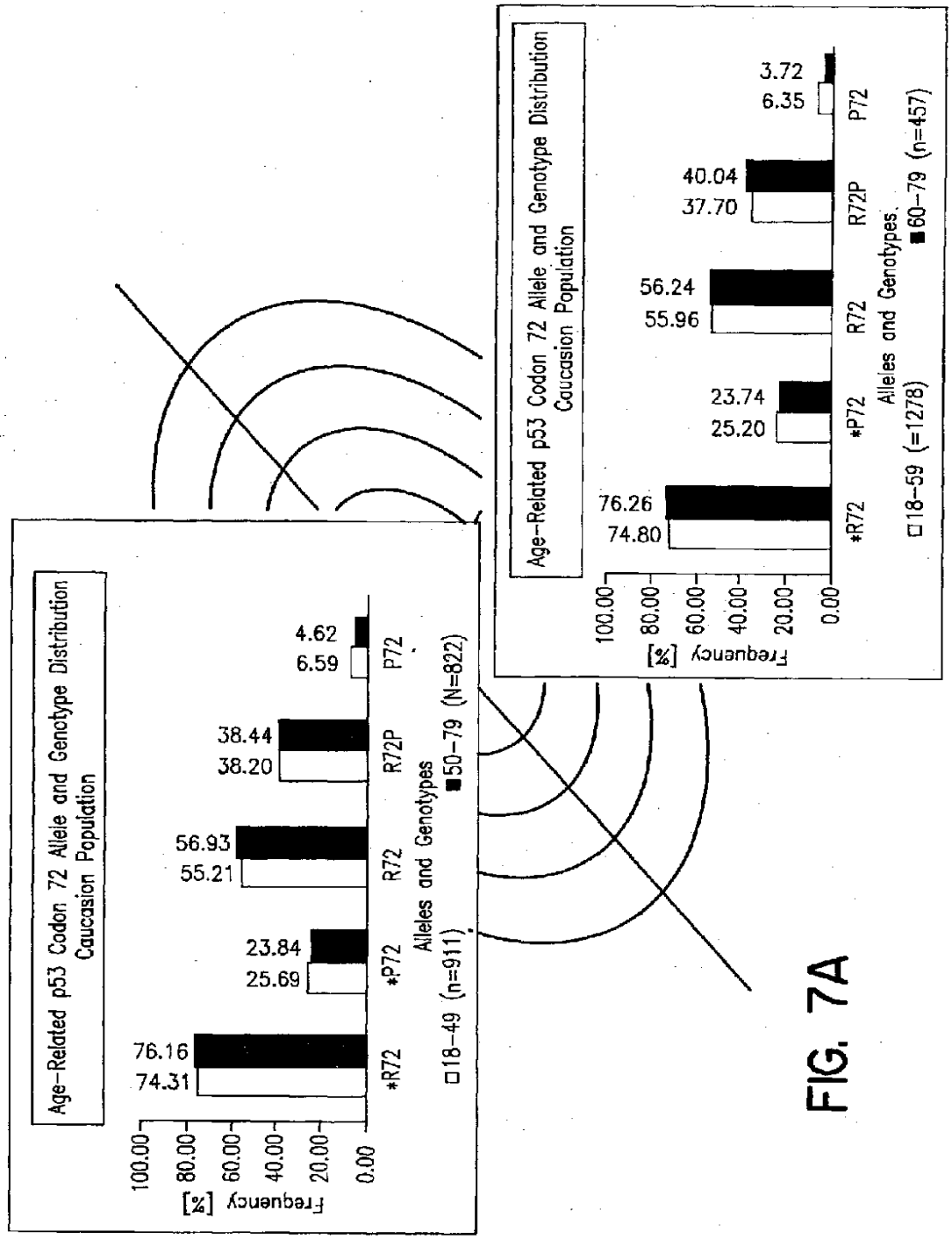

Age-Related p53 Codon 72 Allele and Genotype Distribution
Caucasion Population
Frequency [%]
100.00
80.00
60.00
40.00
20.00
0.00
76.16
74.31
23.84
25.69
56.93
55.21
38.44
38.20
4.62
6.59
*R72
*P72
R72
R72P
P72
Alleles and Genotypes
18-49 (n=911)
50-79 (N=822)
Age-Related p53 Codon 72 Allele and Genotype Distribution
Caucasion Population
76.26
74.80
23.74
25.20
56.24
55.96
40.04
37.70
3.72
6.35
*R72
*P72
R72
R72P
P72
Alleles and Genotypes
18-59 (=1278)
60-79 (n=457)

FIG. 7A

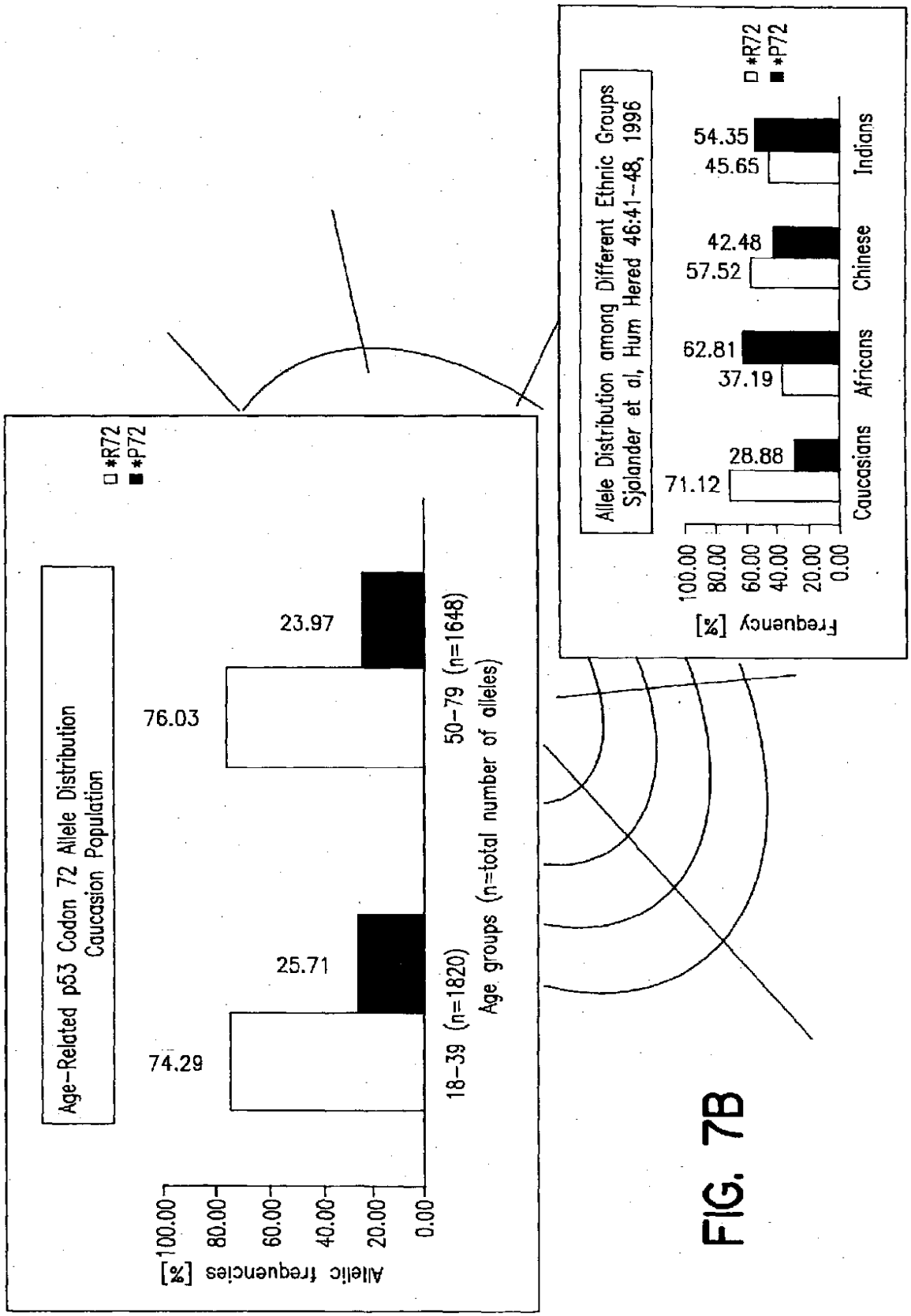
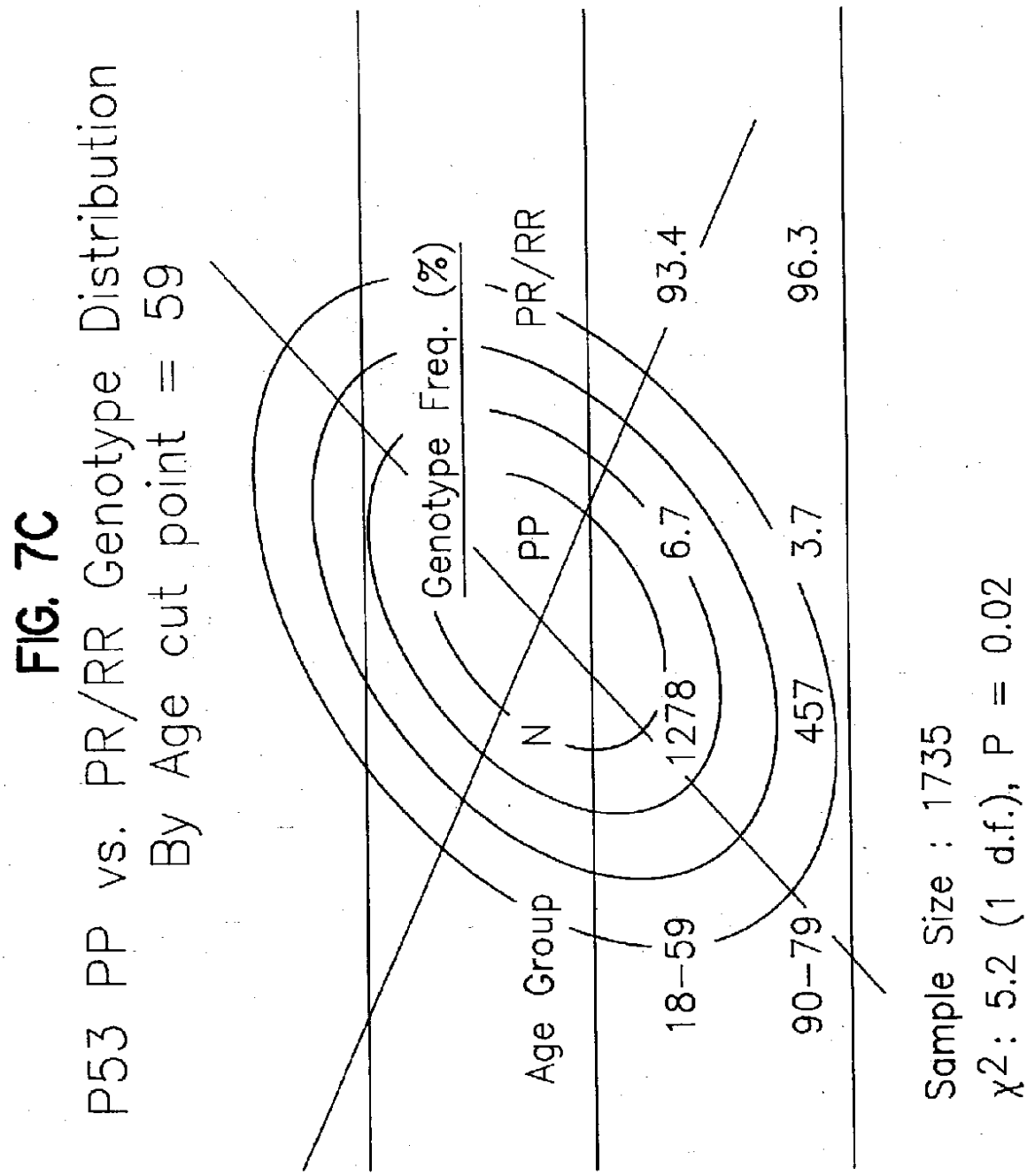

Age-Related p53 Codon 72 Allele Distribution
Caucasion Population
□ *R72
■ *P72
Allelic frequencies [%]
100.00
80.00
60.00
40.00
20.00
0.00
74.29
25.71
76.03
23.97
18–39 (n=1820)
50–79 (n=1648)
Age groups (n=total number of alleles)
Allele Distribution among Different Ethnic Groups
Sjolander et al, Hum Hered 46:41–48, 1996
Frequency [%]
71.12
28.88
37.19
62.81
57.52
42.48
45.65
54.35
Caucasians
Africans
Chinese
Indians

FIG. 7B

FIG. 7C


P53 PP vs. PR/RR Genotype Distribution
By Age cut point = 59
Genotype Freq. (%)
PP
PR/RR
Age Group
N
18–59
90–79
1278
457
6.7
3.7
93.4
96.3
Sample Size : 1735
χ2: 5.2 (1 d.f.), P = 0.02

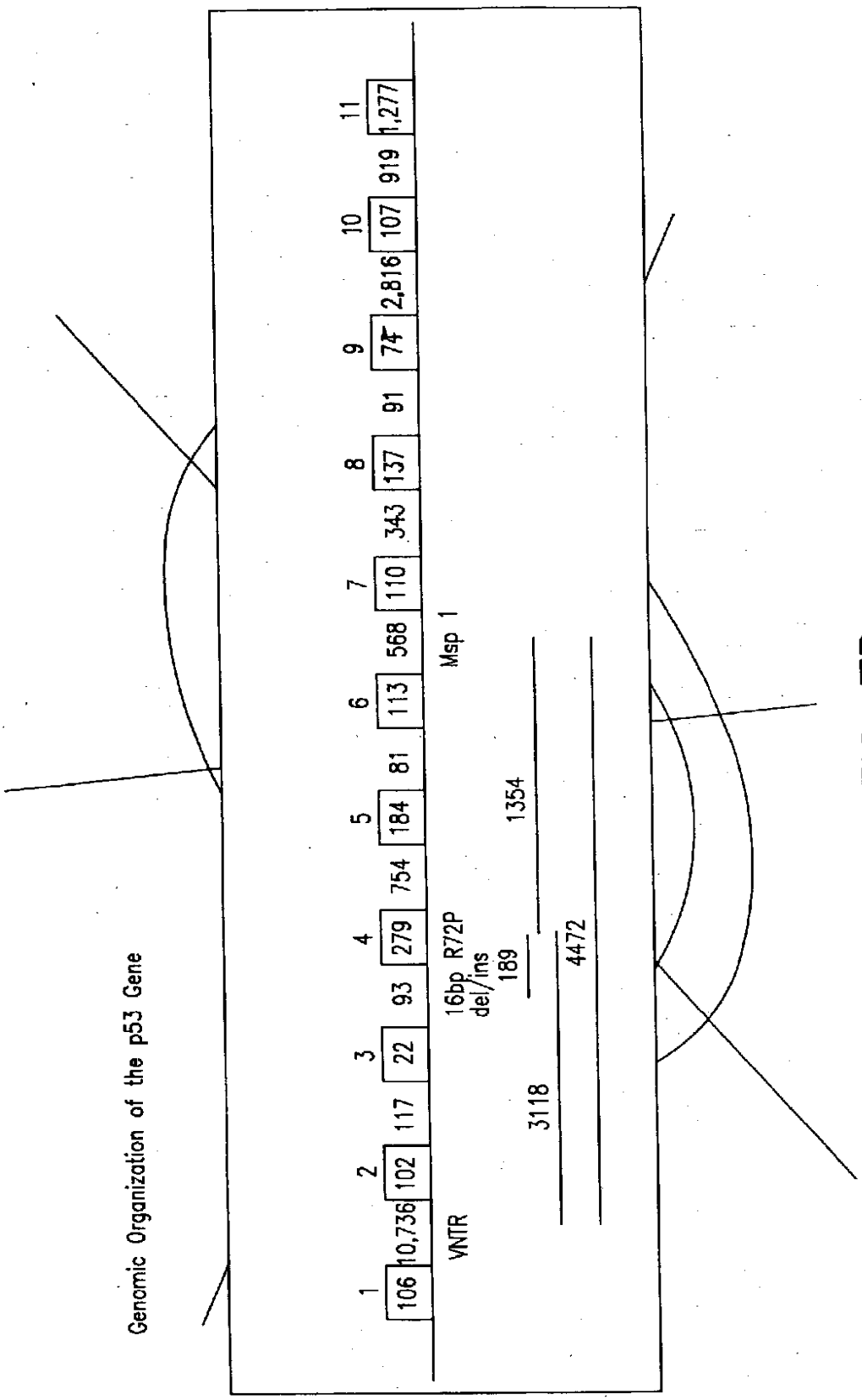
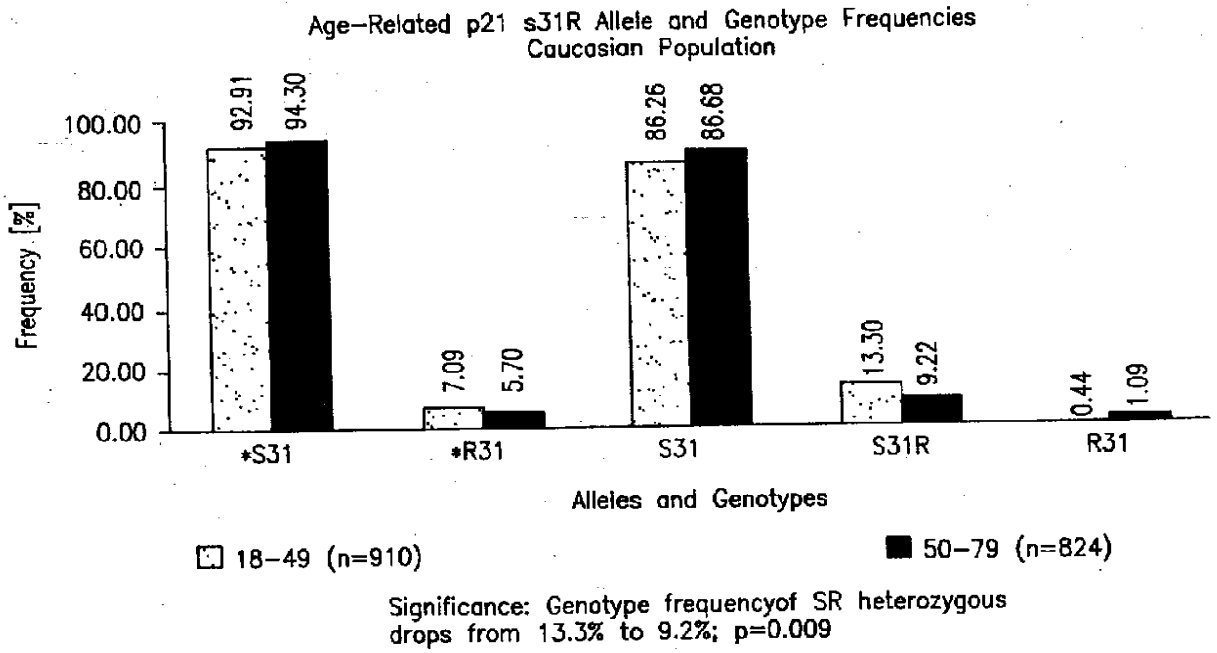

Genomic Organization of the p53 Gene
1
106
10,736
VNTR
2
102
117
3
22
93
4
279
754
5
184
81
6
113
568
Msp 1
7
110
343
8
137
91
9
74
2,816
10
107
919
11
1,277
16bp R72P
del/ins
189
1354
3118
4472

FIG. 7D



Significance: Genotype frequencyof SR heterozygous drops from 13.3% to 9.2%; p=0.009

FIG. 8

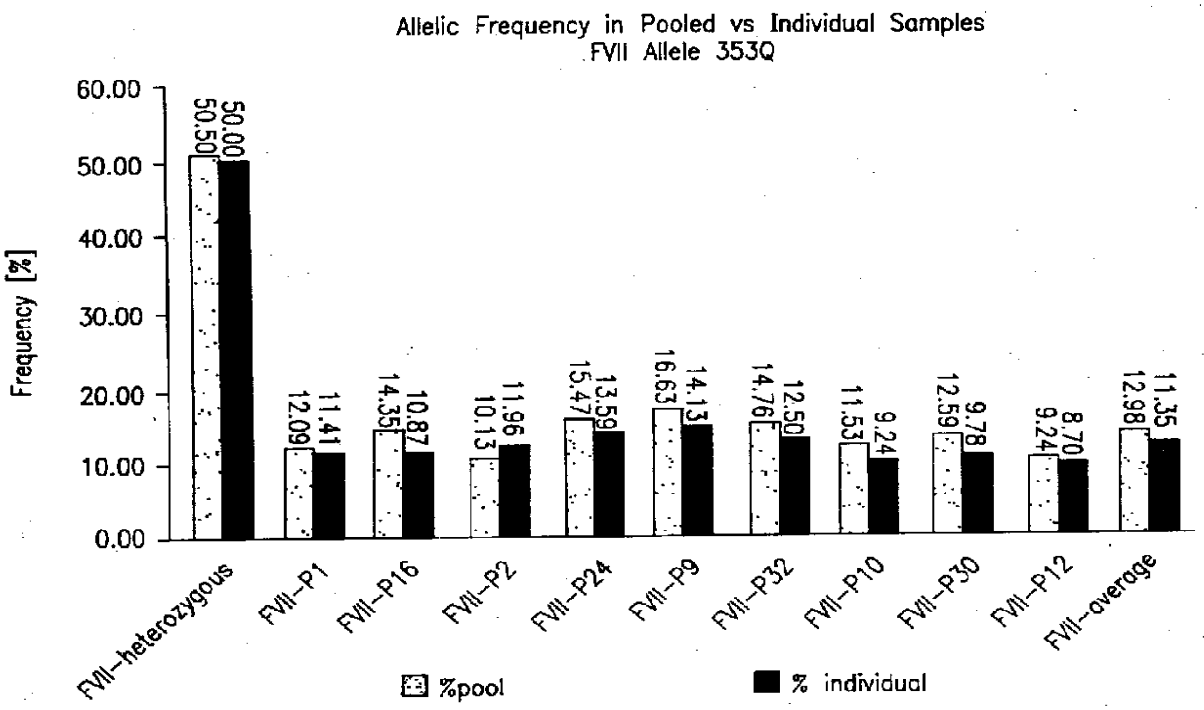

Allelic Frequency in Pooled vs Individual Samples
FVII Allele 353Q
Frequency [%]
60.00
50.00
40.00
30.00
20.00
10.00
0.00
50.50
50.00
12.09
11.41
14.35
10.87
10.13
11.96
15.47
13.59
16.63
14.13
14.76
12.50
11.53
9.24
12.59
9.78
9.24
8.70
12.98
11.35
FVII-heterozygous
FVII-P1
FVII-P16
FVII-P2
FVII-P24
FVII-P9
FVII-P32
FVII-P10
FVII-P30
FVII-P12
FVII-average
%pool
% individual

FIG. 9

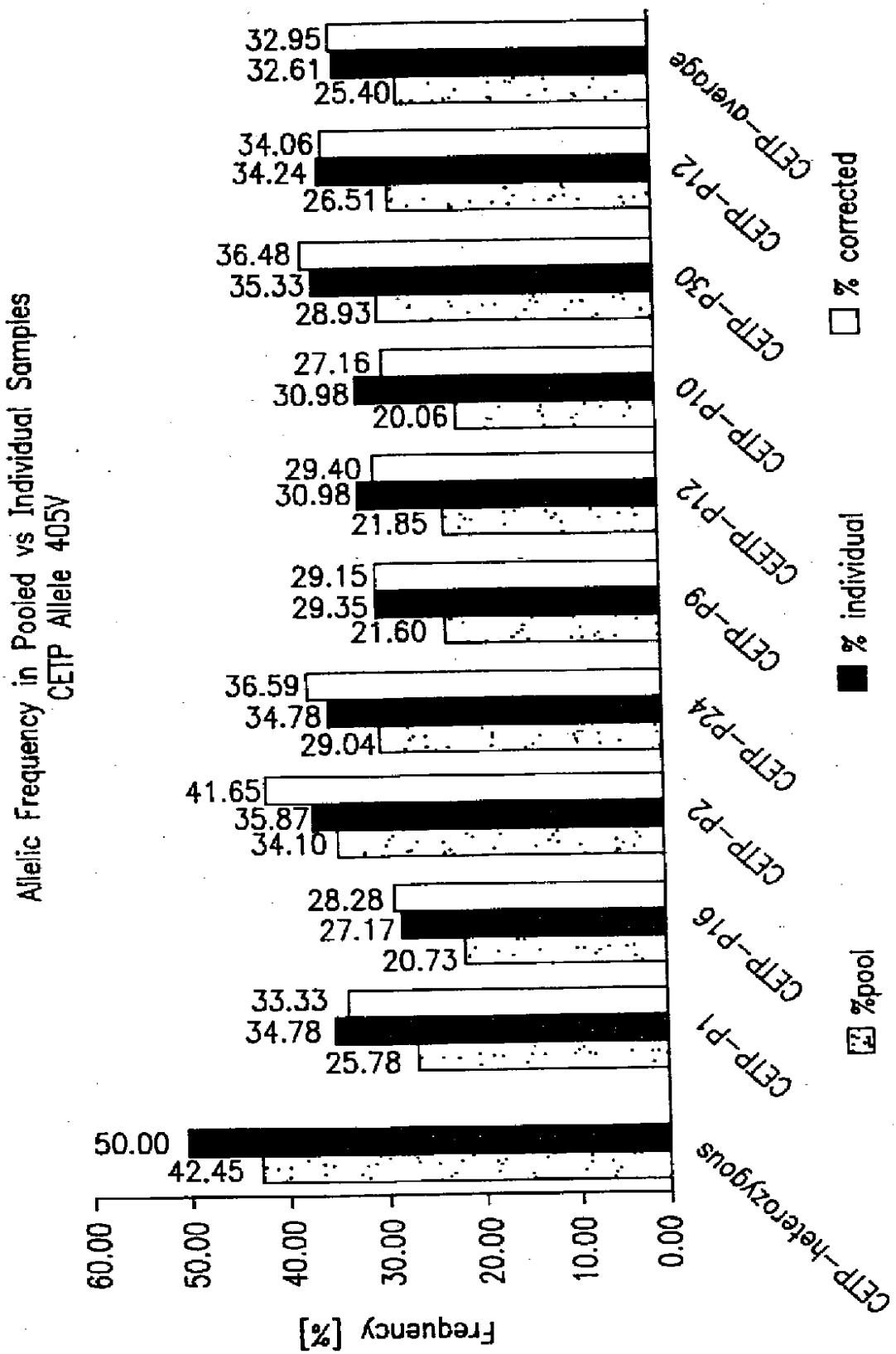

Allelic Frequency in Pooled vs Individual Samples
CETP Allele 405V
Frequency [%]
60.00
50.00
40.00
30.00
20.00
10.00
0.00
CETP-heterozygous
50.00
42.45
CETP-P1
33.33
34.78
25.78
CETP-P16
28.28
27.17
20.73
CETP-P2
41.65
35.87
34.10
CETP-P24
36.59
34.78
29.04
CETP-P9
29.15
29.35
21.60
CETP-P12
29.40
30.98
21.85
CETP-P10
27.16
30.98
20.06
CETP-P30
36.48
35.33
28.93
CETP-P12
34.06
34.24
26.51
CETP-average
32.95
32.61
25.40
%pool
% individual
% corrected

FIG. 10

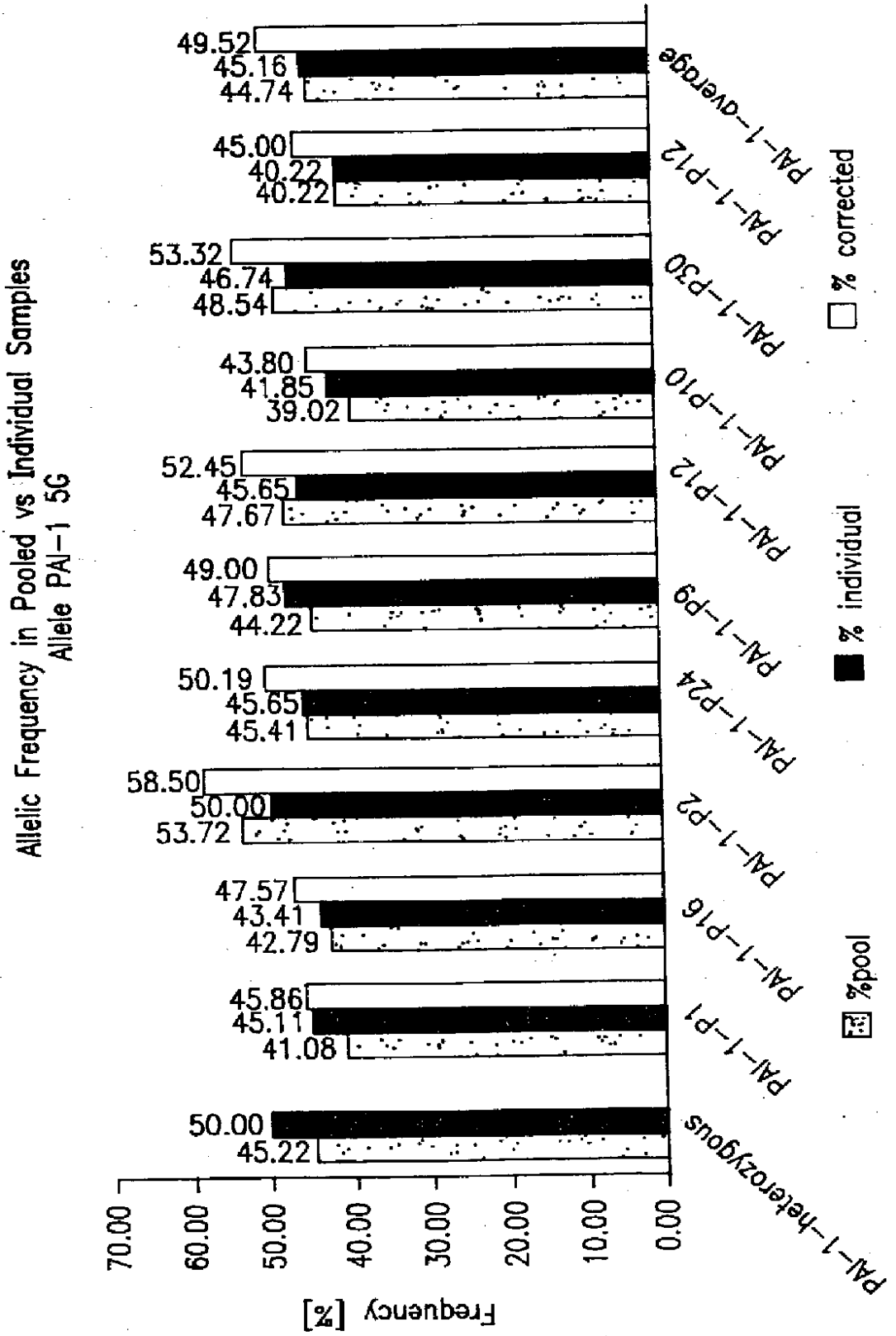

Allelic Frequency in Pooled vs Individual Samples
Allele PAI-1 5G
Frequency [%]
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
% corrected
% individual
%pool
PAI-1-average
PAI-1-P12
PAI-1-P30
PAI-1-P10
PAI-1-P12
PAI-1-P9
PAI-1-P24
PAI-1-P2
PAI-1-P16
PAI-1-P1
PAI-1-heterozygous
49.52
45.16
44.74
45.00
40.22
40.22
53.32
46.74
48.54
43.80
41.85
39.02
52.45
45.65
47.67
49.00
47.83
44.22
50.19
45.65
45.41
58.50
50.00
53.72
47.57
43.41
42.79
45.86
45.11
41.08
50.00
45.22

FIG. 11

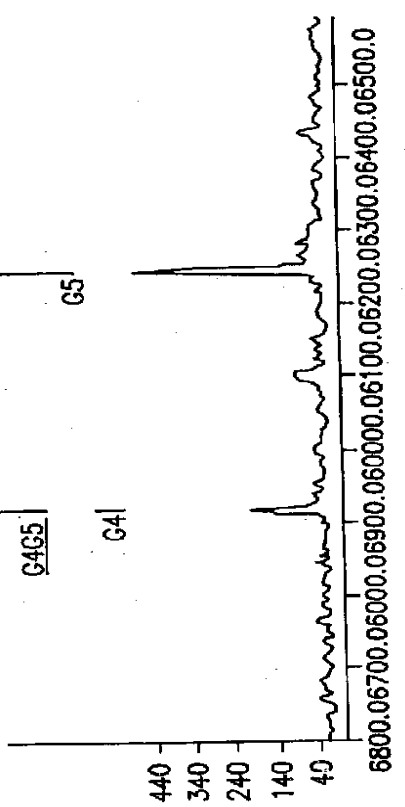


FIG. 12A

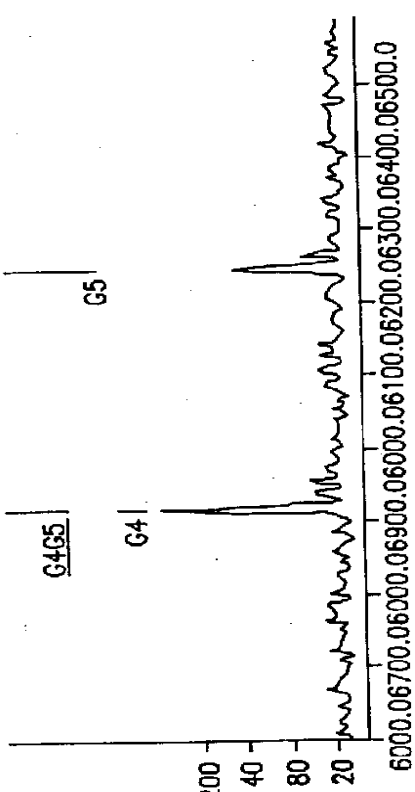


FIG. 12B

FIG. 12C

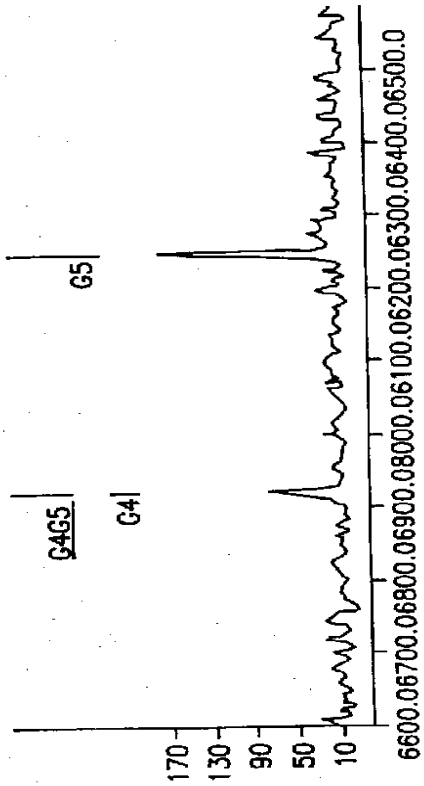


FIG. 12D

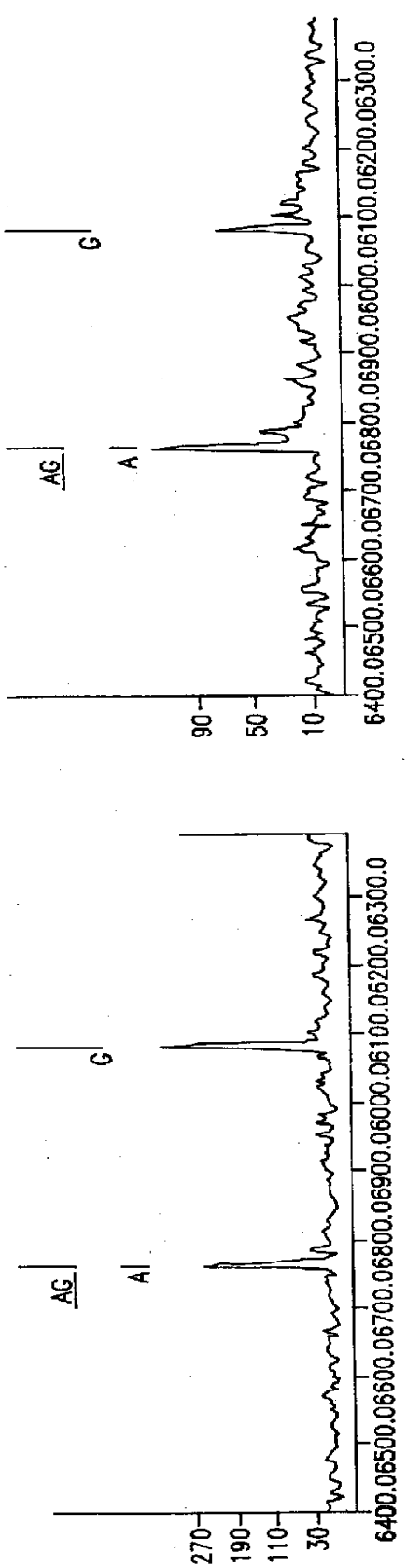


FIG. 13A

FIG. 13B

FIG. 13C

FIG. 13D

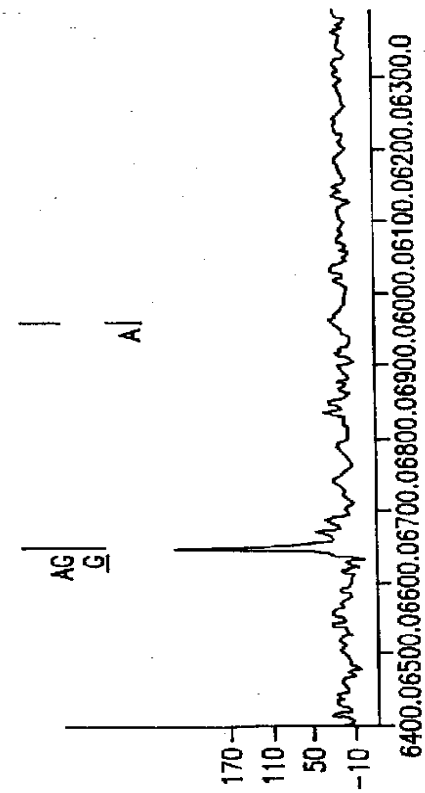


FIG. 14A

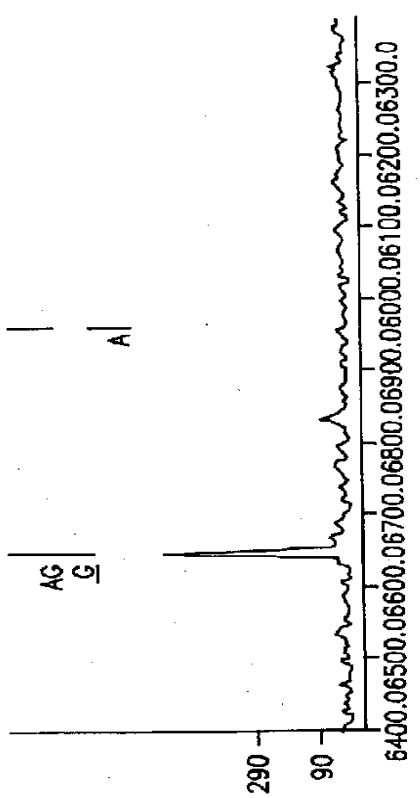


FIG. 14B

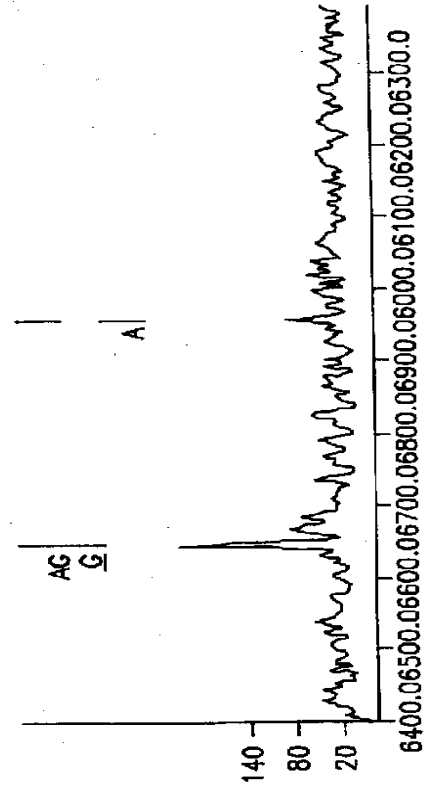


FIG. 14D

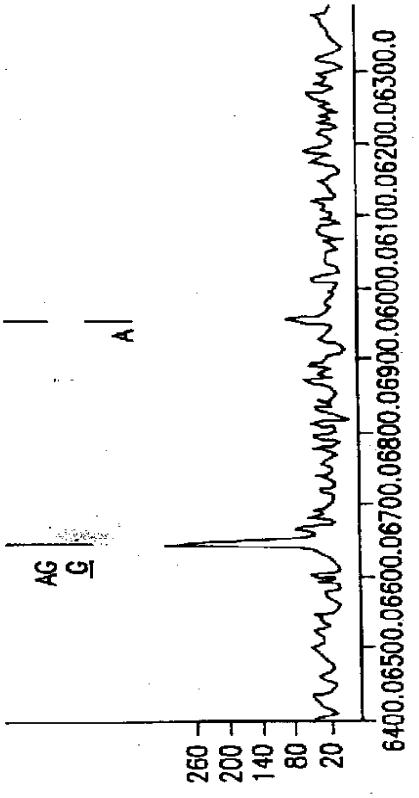


FIG. 14C

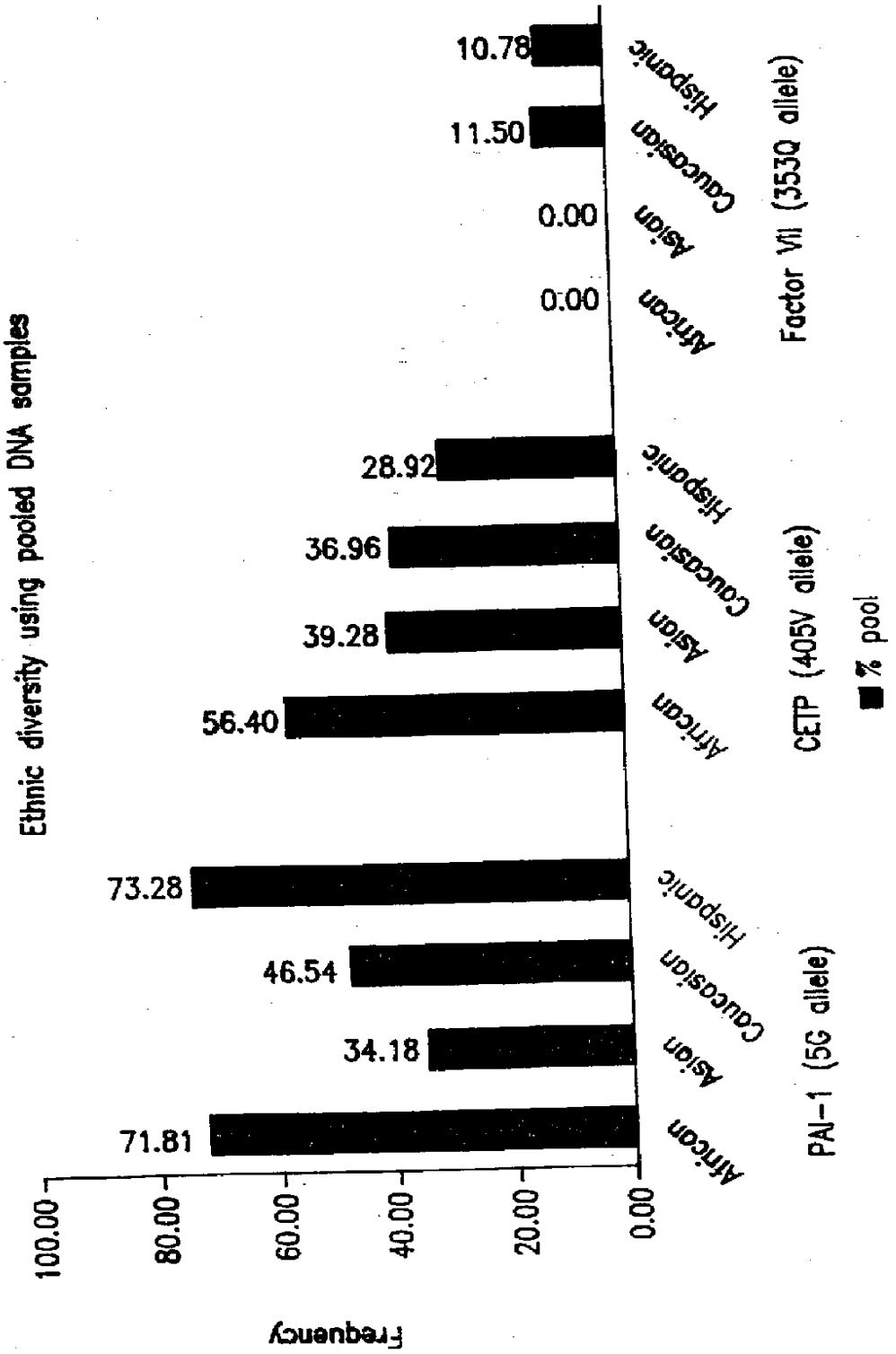

Ethnic diversity using pooled DNA samples
Frequency
100.00
80.00
60.00
40.00
20.00
0.00
10.78
11.50
0.00
0.00
28.92
36.96
39.28
56.40
73.28
46.54
34.18
71.81
Hispanic
Caucasian
Asian
African
Factor VII (353Q allele)
CETP (405V allele)
PAI-1 (5G allele)
% pool

FIG. 15

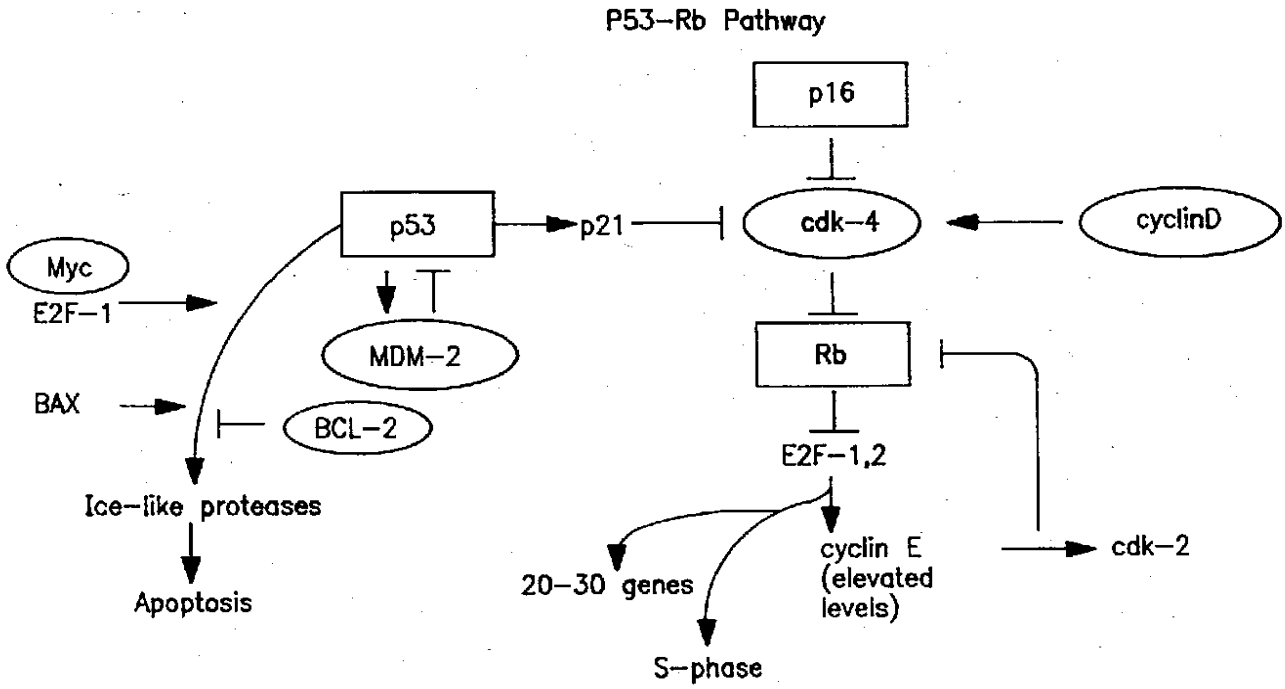

P53–Rb Pathway
p16
p53
p21
cdk–4
cyclinD
Myc
E2F–1
MDM–2
Rb
BAX
BCL–2
E2F–1,2
Ice–like proteases
Apoptosis
20–30 genes
cyclin E
(elevated
levels)
cdk–2
S–phase

FIG. 16

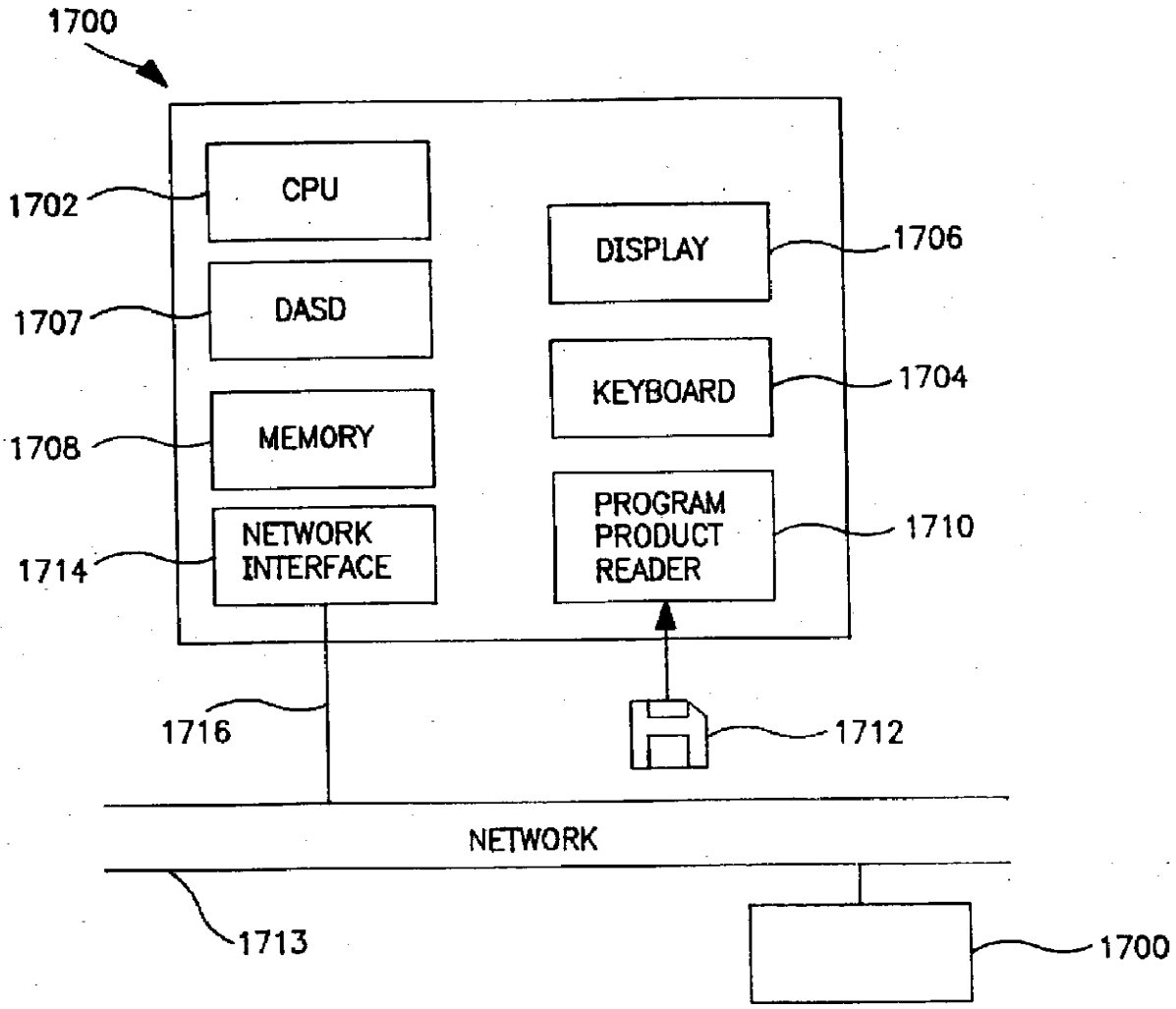

1700
CPU
1702
DASD
1707
MEMORY
1708
NETWORK INTERFACE
1714
DISPLAY
1706
KEYBOARD
1704
PROGRAM PRODUCT READER
1710
1716
1712
NETWORK
1713
1700

FIG. 17

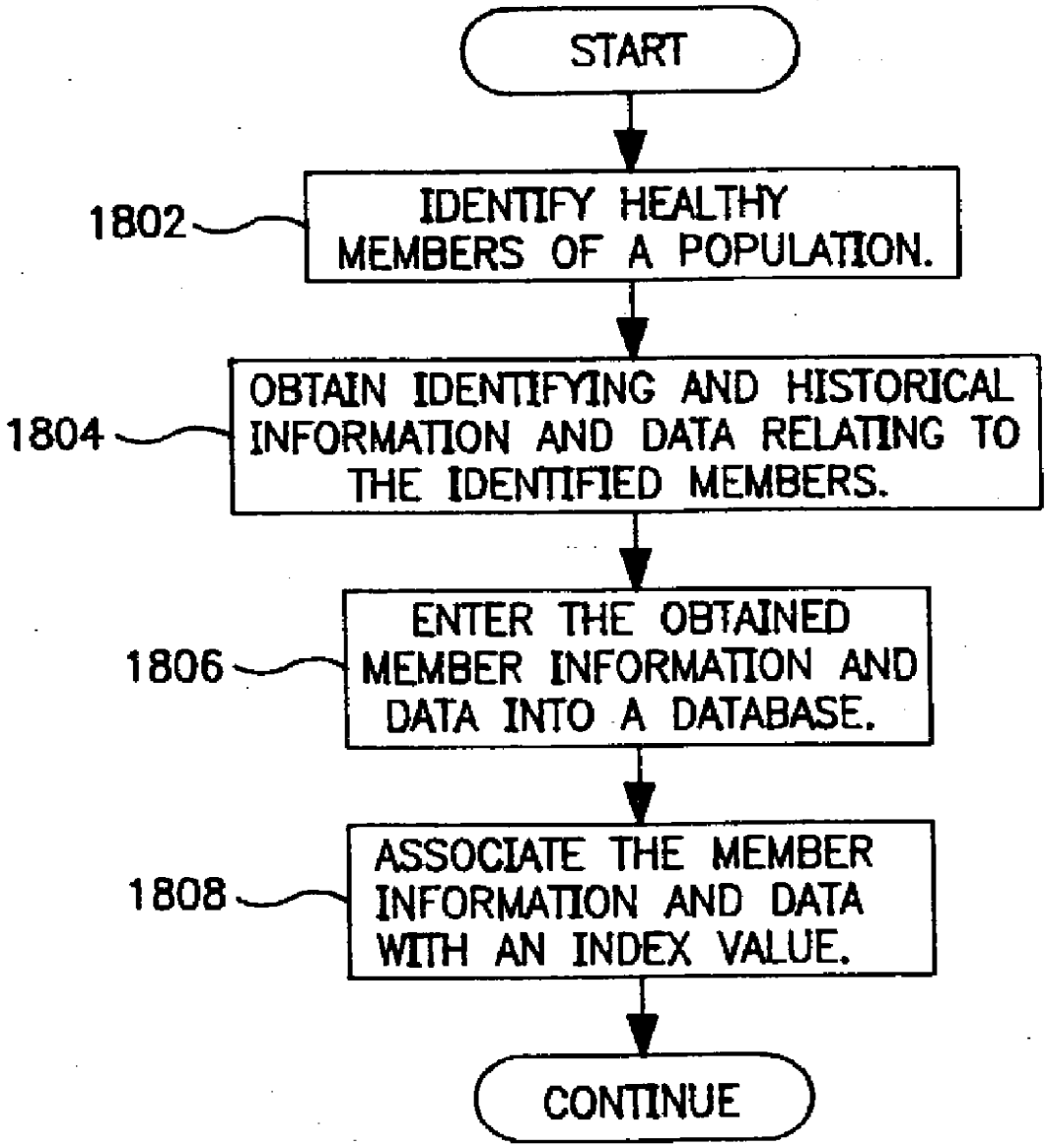

START
1802
IDENTIFY HEALTHY MEMBERS OF A POPULATION.
1804
OBTAIN IDENTIFYING AND HISTORICAL INFORMATION AND DATA RELATING TO THE IDENTIFIED MEMBERS.
1806
ENTER THE OBTAINED MEMBER INFORMATION AND DATA INTO A DATABASE.
1808
ASSOCIATE THE MEMBER INFORMATION AND DATA WITH AN INDEX VALUE.
CONTINUE

FIG. 18

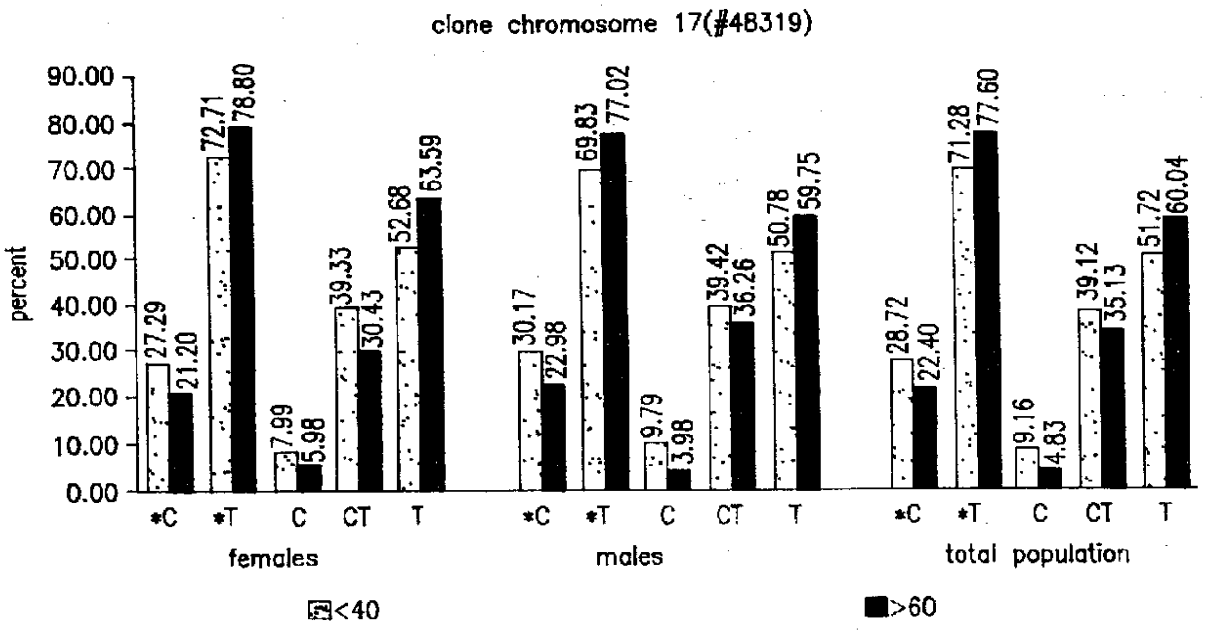

clone chromosome 17(#48319)
percent
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
27.29
21.20
72.71
78.80
7.99
5.98
39.33
30.43
52.68
63.59
30.17
22.98
69.83
77.02
9.79
3.98
39.42
36.26
50.78
59.75
28.72
22.40
71.28
77.60
9.16
4.83
39.12
35.13
51.72
60.04
*C
*T
C
CT
T
females
males
total population
<40
>60

FIG. 19

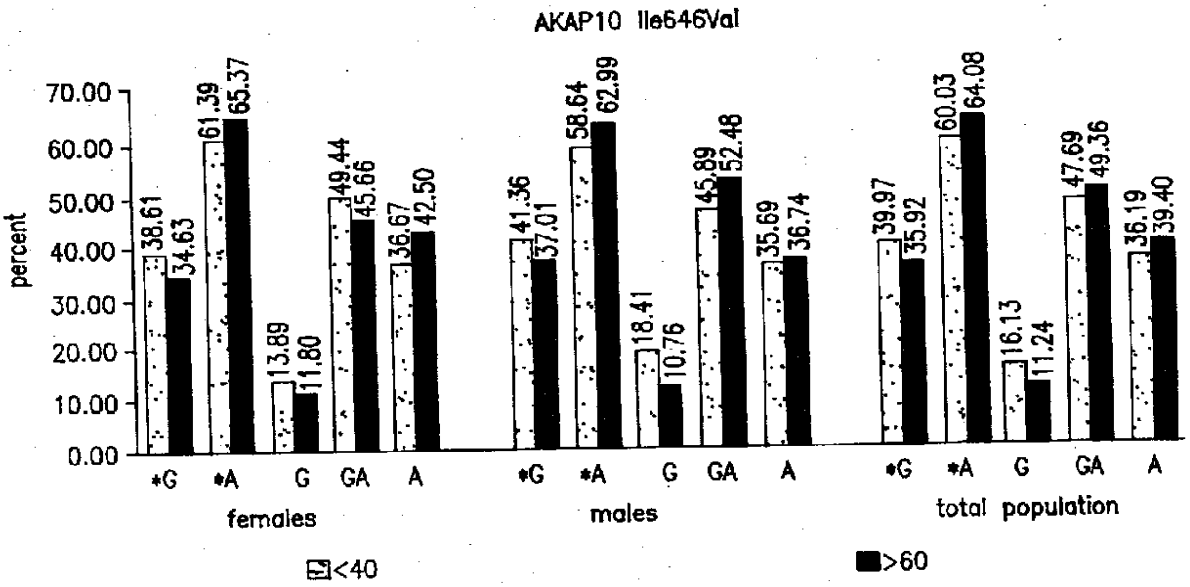

AKAP10 Ile646Val
percent
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
38.61
34.63
61.39
65.37
13.89
11.80
49.44
45.66
36.67
42.50
41.36
37.01
58.64
62.99
18.41
10.76
45.89
52.48
35.69
36.74
39.97
35.92
60.03
64.08
16.13
11.24
47.69
49.36
36.19
39.40
*G
*A
G
GA
A
females
males
total population
<40
>60

FIG. 20

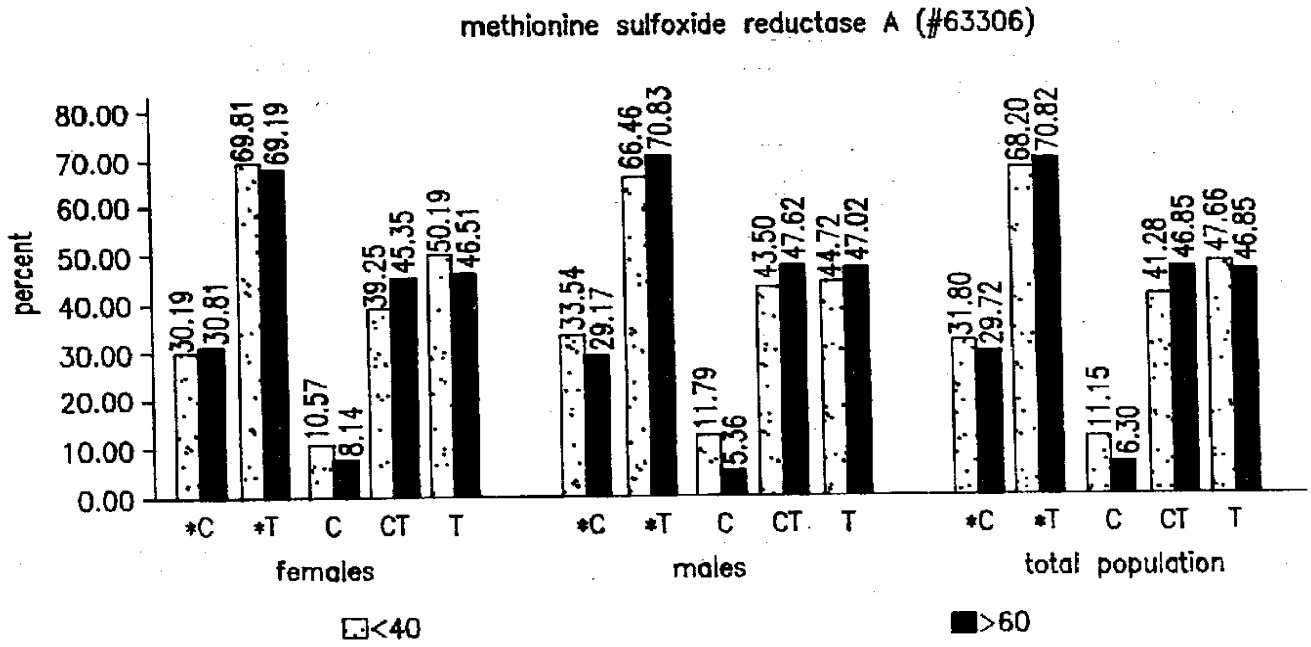

methionine sulfoxide reductase A (#63306)
percent
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
30.19
30.81
69.81
69.19
10.57
8.14
39.25
45.35
50.19
46.51
33.54
29.17
66.46
70.83
11.79
5.36
43.50
47.62
44.72
47.02
31.80
29.72
68.20
70.82
11.15
6.30
41.28
46.85
47.66
46.85
*C
*T
C
CT
T
females
males
total population
<40
>60

FIG. 21

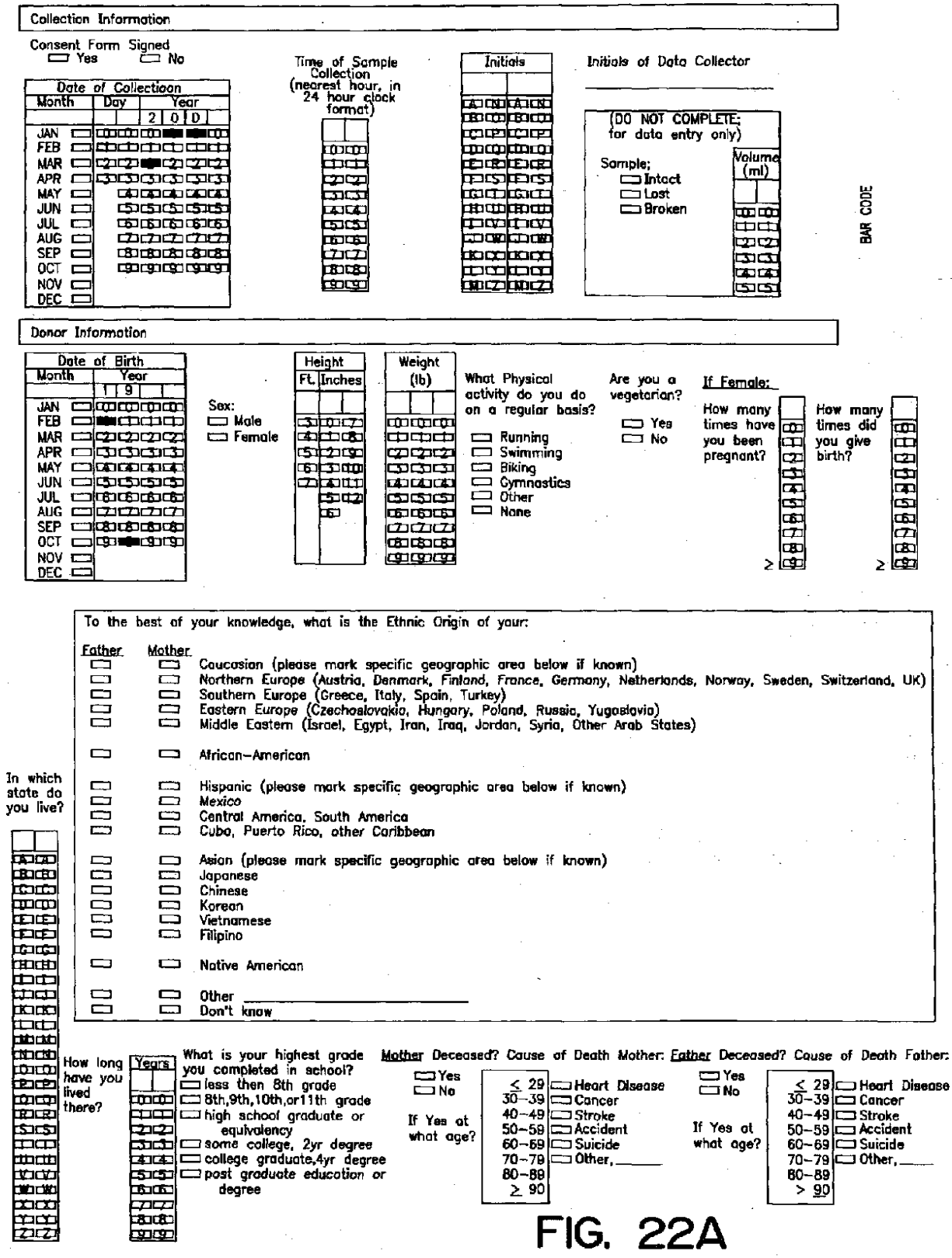

Collection Information
Consent Form Signed
Yes
No
Date of Collection
Month
Day
Year
2 0 D
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Time of Sample Collection (nearest hour, in 24 hour clock format)
Initials
Initials of Data Collector
(DO NOT COMPLETE; for data entry only)
Sample:
Intact
Lost
Broken
Volume (ml)
BAR CODE
Donor Information
Date of Birth
Month
Year
1 9
Sex:
Male
Female
Height
Ft. Inches
Weight (lb)
What Physical activity do you do on a regular basis?
Running
Swimming
Biking
Gymnastics
Other
None
Are you a vegetarian?
Yes
No
If Female:
How many times have you been pregnant?
How many times did you give birth?
To the best of your knowledge, what is the Ethnic Origin of your:
Father
Mother
Caucasian (please mark specific geographic area below if known)
Northern Europe (Austria, Denmark, Finland, France, Germany, Netherlands, Norway, Sweden, Switzerland, UK)
Southern Europe (Greece, Italy, Spain, Turkey)
Eastern Europe (Czechoslovakia, Hungary, Poland, Russia, Yugoslavia)
Middle Eastern (Israel, Egypt, Iran, Iraq, Jordan, Syria, Other Arab States)
African-American
Hispanic (please mark specific geographic area below if known)
Mexico
Central America, South America
Cuba, Puerto Rico, other Caribbean
Asian (please mark specific geographic area below if known)
Japanese
Chinese
Korean
Vietnamese
Filipino
Native American
Other
Don't know
In which state do you live?
How long have you lived there?
Years
What is your highest grade you completed in school?
less then 8th grade
8th,9th,10th,or11th grade
high school graduate or equivalency
some college, 2yr degree
college graduate,4yr degree
post graduate education or degree
Mother Deceased?
Yes
No
If Yes at what age?
Cause of Death Mother:
≤ 29
30-39
40-49
50-59
60-69
70-79
80-89
≥ 90
Heart Disease
Cancer
Stroke
Accident
Suicide
Other,
Father Deceased?
Yes
No
If Yes at what age?
Cause of Death Father:
≤ 29
30-39
40-49
50-59
60-69
70-79
80-89
> 90
Heart Disease
Cancer
Stroke
Accident
Suicide
Other,

FIG. 22A

Have you ever smoked? ☐ Yes ☐ No

If yes, for how long? ☐☐ Years

Have you been hospitalized in the past 5 years for more then 6 days at a time? ☐ Yes ☐ No

If yes, how many times? ☐☐

For each hospitalization (if not the same) how long did you stay and for what reason?

1) Weeks: ☐☐
- ☐ Acute disorder, including infection and thrombosis
- ☐ Chronic Disorder
- ☐ Accident
- ☐ Other:_____

2) Weeks: ☐☐
- ☐ Acute disorder, including infection and thrombosis
- ☐ Chronic Disorder
- ☐ Accident
- ☐ Other:_____

3) Weeks: ☐☐
- ☐ Acute disorder, including infection and thrombosis
- ☐ Chronic Disorder
- ☐ Accident
- ☐ Other:_____

Have you or has anyone in your immediate family (parents,brothers,sisters,or your children) had the following?
Mark all that apply!

Disease	You	Mother	Father	Sister	Brother	Child
Heart Disease, including arteriosclerosis	☐	☐	☐	☐	☐	☐
Stroke	☐	☐	☐	☐	☐	☐
Hypertension	☐	☐	☐	☐	☐	☐
Blood clots	☐	☐	☐	☐	☐	☐
Diabetes, insulin dependent	☐	☐	☐	☐	☐	☐
Diabetes, not insulin-dependent (diet controlled)	☐	☐	☐	☐	☐	☐
Cancer:	☐	☐	☐	☐	☐	☐
Lung&Bronchus	☐	☐	☐	☐	☐	☐
Breasts	☐	☐	☐	☐	☐	☐
Prostate	☐	☐	☐	☐	☐	☐
Colon&Rectum	☐	☐	☐	☐	☐	☐
Skin	☐	☐	☐	☐	☐	☐
Lymphoma&Leukemia	☐	☐	☐	☐	☐	☐
Other, please specify below:	☐	☐	☐	☐	☐	☐
Alzheimer's Disease	☐	☐	☐	☐	☐	☐
Epilepsy	☐	☐	☐	☐	☐	☐
Schizophrenia	☐	☐	☐	☐	☐	☐
Bipolar disorder (manic depression)	☐	☐	☐	☐	☐	☐
Major depression	☐	☐	☐	☐	☐	☐
Chronic Inflammatory or Autoimmune Disease including Multiple Sclerosis and Rheumatoid Arthritis	☐	☐	☐	☐	☐	☐
Emphysema	☐	☐	☐	☐	☐	☐
Asthma	☐	☐	☐	☐	☐	☐
Other, please specify below:	☐	☐	☐	☐	☐	☐

Do you take prescription drugs on a regular basis? ☐ Yes ☐ No

If yes, please specify below:

Have you ever donated blood before? ☐ Yes ☐ No

If yes, how many times: Number of Times ☐☐☐

Additional health information details you would like to provide:

FOR OFFICE USE ONLY

Do you drink any kind of alcoholic beverage?
- ☐ Never
- ☐ Hardly ever
- ☐ Less than 3 times per week
- ☐ 3 or more times per week
- ☐ Daily

FIG. 22B

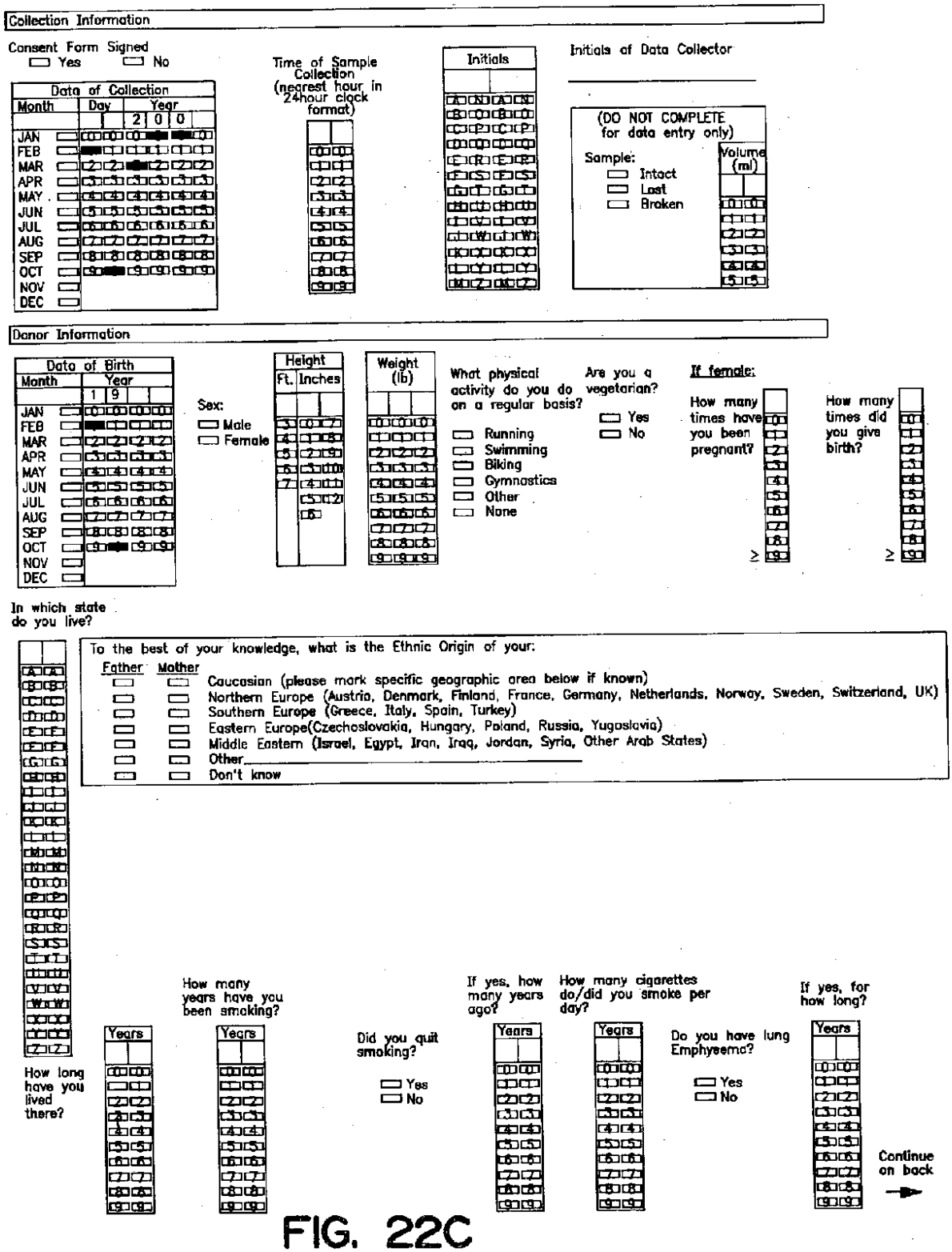

Collection Information
Consent Form Signed
Yes
No
Date of Collection
Month
Day
Year
2 0 0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Time of Sample Collection (nearest hour in 24hour clock format)
Initials
Initials of Data Collector
(DO NOT COMPLETE for data entry only)
Sample:
Intact
Lost
Broken
Volume (ml)
Donor Information
Date of Birth
Month
Year
1 9
Sex:
Male
Female
Height
Ft. Inches
Weight (lb)
What physical activity do you do on a regular basis?
Running
Swimming
Biking
Gymnastics
Other
None
Are you a vegetarian?
Yes
No
If female:
How many times have you been pregnant?
How many times did you give birth?
In which state do you live?
How long have you lived there?
To the best of your knowledge, what is the Ethnic Origin of your:
Father
Mother
Caucasian (please mark specific geographic area below if known)
Northern Europe (Austria, Denmark, Finland, France, Germany, Netherlands, Norway, Sweden, Switzerland, UK)
Southern Europe (Greece, Italy, Spain, Turkey)
Eastern Europe(Czechoslovakia, Hungary, Poland, Russia, Yugoslavia)
Middle Eastern (Israel, Egypt, Iran, Iraq, Jordan, Syria, Other Arab States)
Other
Don't know
Years
How many years have you been smoking?
Did you quit smoking?
Yes
No
If yes, how many years ago?
How many cigarettes do/did you smoke per day?
Do you have lung Emphyseme?
Yes
No
If yes, for how long?
Continue on back

FIG. 22C

What is your highest grade you completed in school?
- ☐ less then 8th grade
- ☐ 8th,9th,10th,or11th grade
- ☐ high school graduate or equivalency
- ☐ some college, 2yr degree
- ☐ college graduate,4yr degree
- ☐ post graduate education or degree

Mother Deceased? ☐ Yes ☐ No
If Yes at what age? ☐ ≤ 29 ☐ 30–39 ☐ 40–49 ☐ 50–59 ☐ 60–69 ☐ 70–79 ☐ 80–89 ☐ ≥ 90

Cause of Death Mother: ☐ Heart Disease ☐ Cancer ☐ Stroke ☐ Accident ☐ Suicide ☐ Other,_____

Father Deceased? ☐ Yes ☐ No
If Yes at what age? ☐ ≤ 29 ☐ 30–39 ☐ 40–49 ☐ 50–59 ☐ 60–69 ☐ 70–79 ☐ 80–89 ☐ > 90

Cause of Death Father: ☐ Heart Disease ☐ Cancer ☐ Stroke ☐ Accident ☐ Suicide ☐ Other,_____

Health Information

Have you or has anyone in your immediate family (parents,brothers,sisters,or your children) had the following? Mark all that apply!

Disease	You	Mother	Father	Sister	Brother	Child
Heart Disease	☐	☐	☐	☐	☐	☐
Stroke	☐	☐	☐	☐	☐	☐
Hypertension	☐	☐	☐	☐	☐	☐
Blood clots	☐	☐	☐	☐	☐	☐
Diabetes, insulin dependent	☐	☐	☐	☐	☐	☐
Diabetes, not insulin-dependent	☐	☐	☐	☐	☐	☐
Cancer:	☐	☐	☐	☐	☐	☐
Lung&Bronchus	☐	☐	☐	☐	☐	☐
Breasts	☐	☐	☐	☐	☐	☐
Prostate	☐	☐	☐	☐	☐	☐
Colon&Rectum	☐	☐	☐	☐	☐	☐
Skin	☐	☐	☐	☐	☐	☐
Lymphoma&Leukemia	☐	☐	☐	☐	☐	☐
Other, please specify below:	☐	☐	☐	☐	☐	☐
Alzheimer's Disease	☐	☐	☐	☐	☐	☐
Epilepsy	☐	☐	☐	☐	☐	☐
Schizophrenia	☐	☐	☐	☐	☐	☐
Bipolar disorder (manic depression)	☐	☐	☐	☐	☐	☐
Major depression	☐	☐	☐	☐	☐	☐
Chronic Inflammatory or Autoimmune Disease including Multiple Sclerosis and Rheumatoid Arthritis	☐	☐	☐	☐	☐	☐
Emphysema	☐	☐	☐	☐	☐	☐
Asthma	☐	☐	☐	☐	☐	☐
Other, please specify below:						

Do you take prescription drugs on a regular basis? ☐ Yes ☐ No

If yes, please specify below:

Have you ever donated blood before? ☐ Yes ☐ No

If yes, how many times:

Number of Times

Have you been hospitalized in the past 5 years for more then 6 days at a time? ☐ Yes ☐ No

If yes, how many times? ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8 ☐9

For each hospitalization (if not the same) how long did you stay and for what reason?

1) Weeks: ☐1 ☐2 ☐3 ☐4 ☐5 ☐6
- ☐ Acute disorder, including infection and thrombosis
- ☐ Chronic Disorder
- ☐ Accident
- ☐ Other:_____

2) Weeks: ☐1 ☐2 ☐3 ☐4 ☐5 ☐6
- ☐ Acute disorder, including infection and thrombosis
- ☐ Chronic Disorder
- ☐ Accident
- ☐ Other:_____

3) Weeks: ☐1 ☐2 ☐3 ☐4 ☐5 ☐6
- ☐ Acute disorder, including infection and thrombosis
- ☐ Chronic Disorder
- ☐ Accident
- ☐ Other:_____

Do you drink any kind of alcoholic beverage?
- ☐ Never
- ☐ Hardly ever
- ☐ Less than 3 times per week
- ☐ 3 or more times per week
- ☐ Daily

Additional health information details you would like to provide:

FOR OFFICE USE ONLY

FIG. 22D

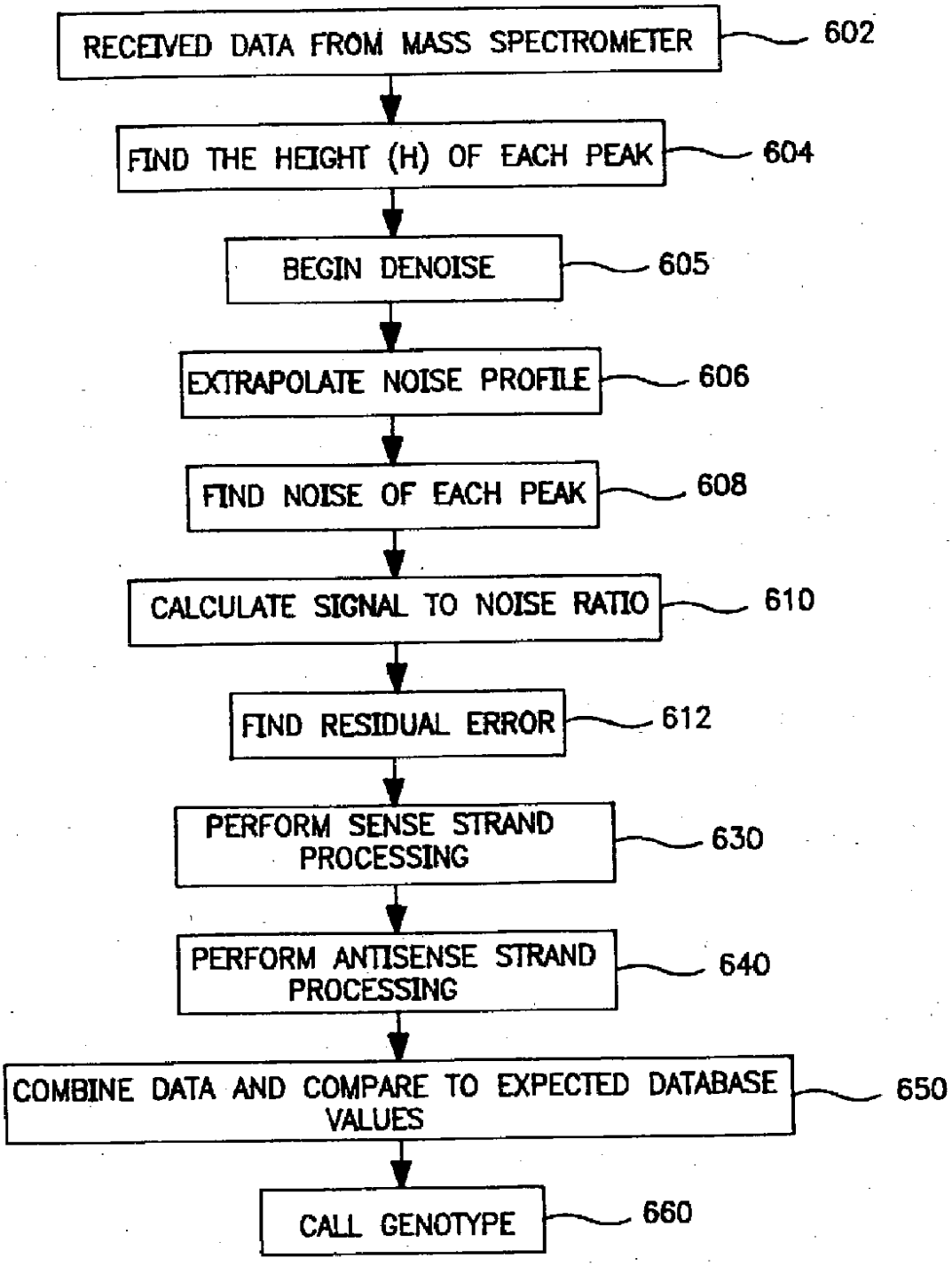

RECEIVED DATA FROM MASS SPECTROMETER
602
FIND THE HEIGHT (H) OF EACH PEAK
604
BEGIN DENOISE
605
EXTRAPOLATE NOISE PROFILE
606
FIND NOISE OF EACH PEAK
608
CALCULATE SIGNAL TO NOISE RATIO
610
FIND RESIDUAL ERROR
612
PERFORM SENSE STRAND PROCESSING
630
PERFORM ANTISENSE STRAND PROCESSING
640
COMBINE DATA AND COMPARE TO EXPECTED DATABASE VALUES
650
CALL GENOTYPE
660

FIG. 23

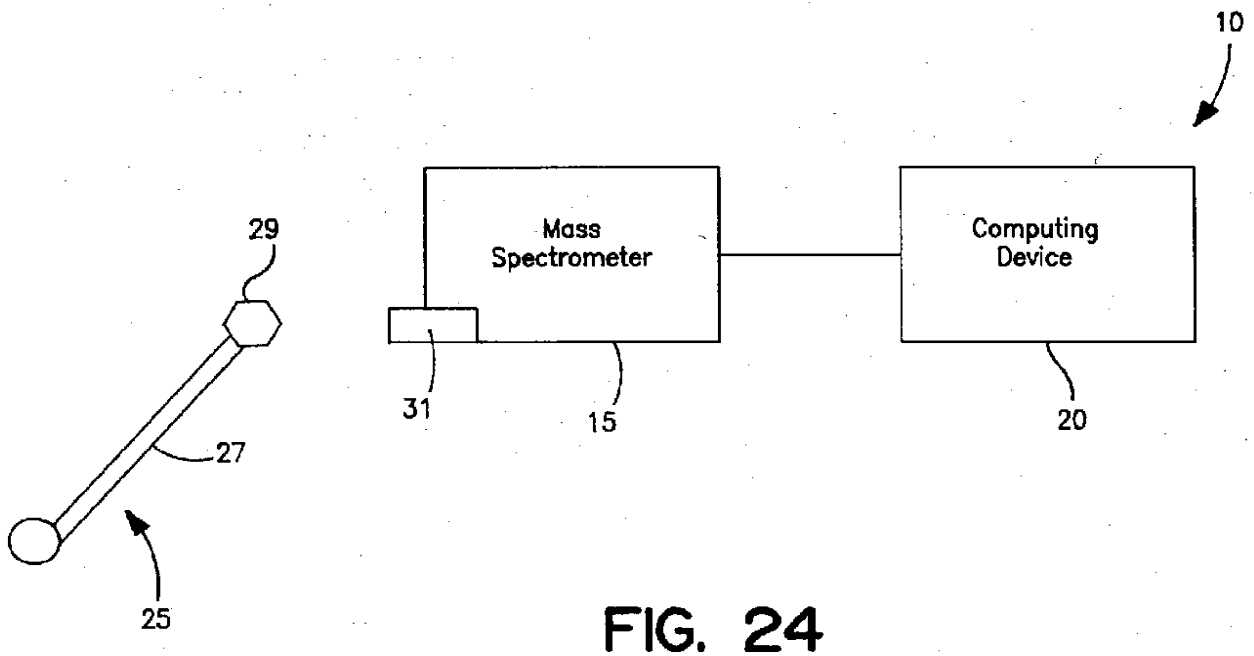


FIG. 24

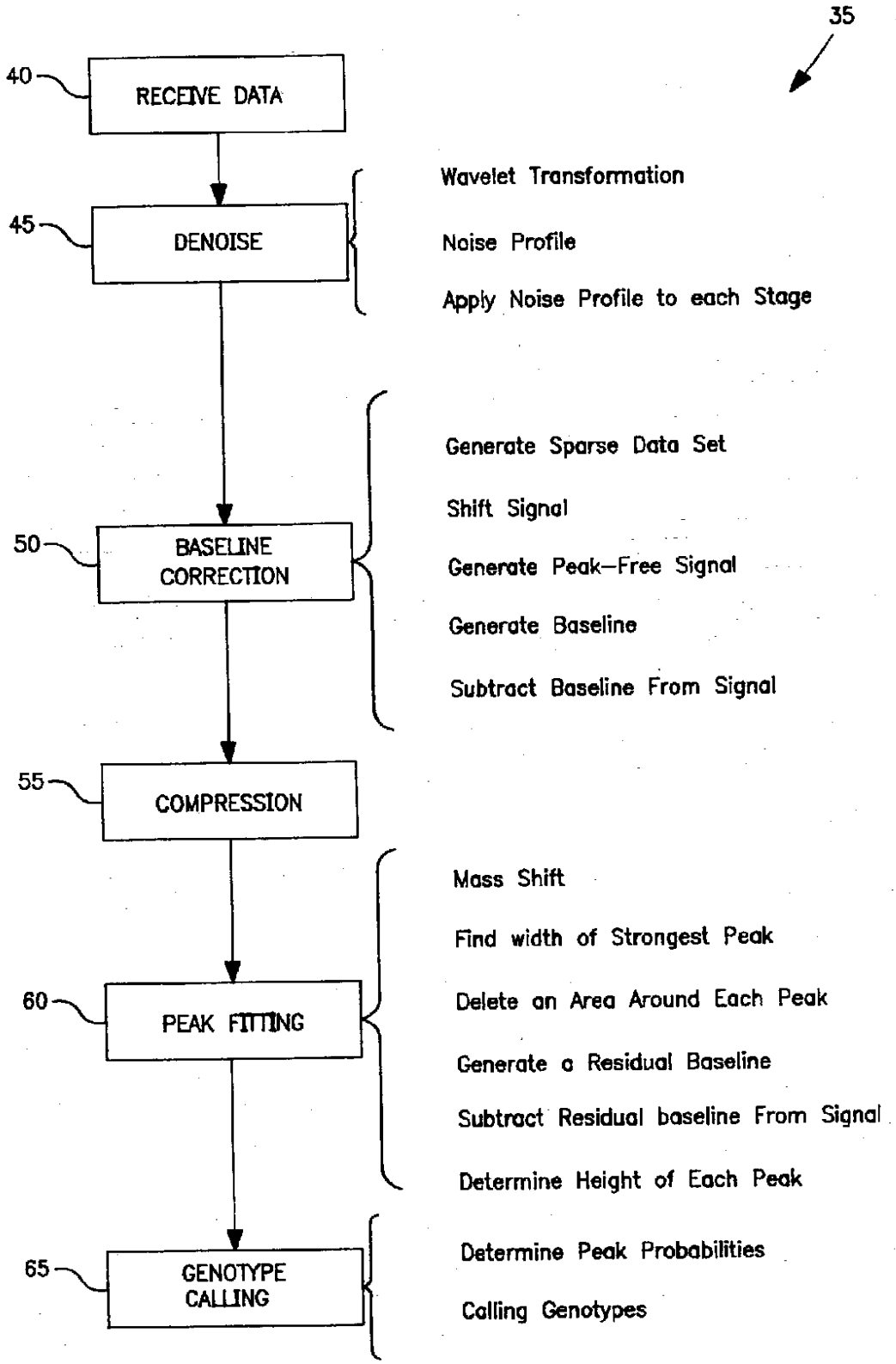

35
40
RECEIVE DATA
45
DENOISE
Wavelet Transformation
Noise Profile
Apply Noise Profile to each Stage
50
BASELINE CORRECTION
Generate Sparse Data Set
Shift Signal
Generate Peak–Free Signal
Generate Baseline
Subtract Baseline From Signal
55
COMPRESSION
60
PEAK FITTING
Mass Shift
Find width of Strongest Peak
Delete an Area Around Each Peak
Generate a Residual Baseline
Subtract Residual baseline From Signal
Determine Height of Each Peak
65
GENOTYPE CALLING
Determine Peak Probabilities
Calling Genotypes

FIG. 25

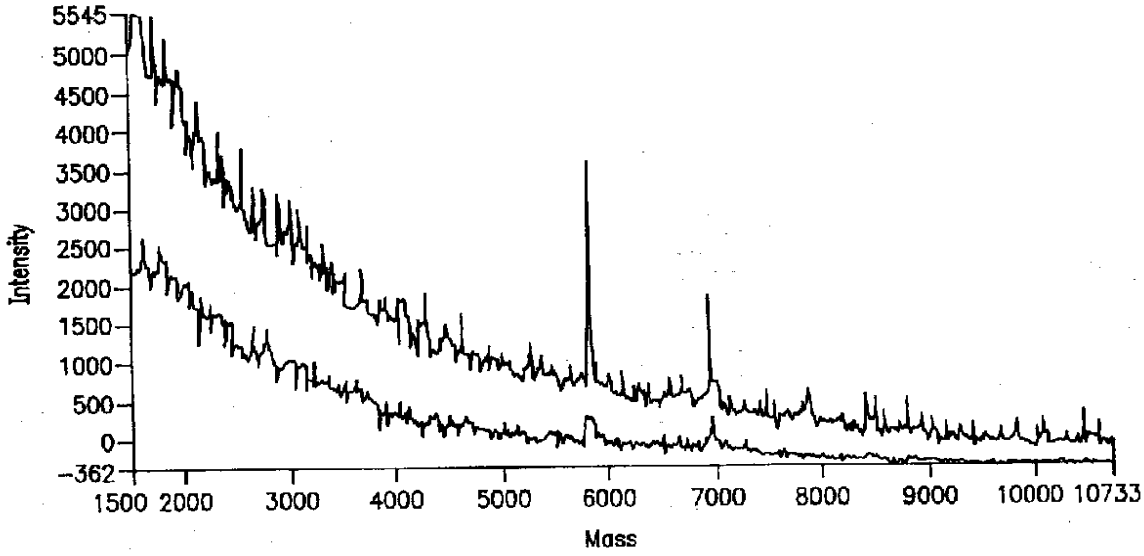

5545
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-362
Intensity
1500 2000 3000 4000 5000 6000 7000 8000 9000 10000 10733
Mass

FIG. 26

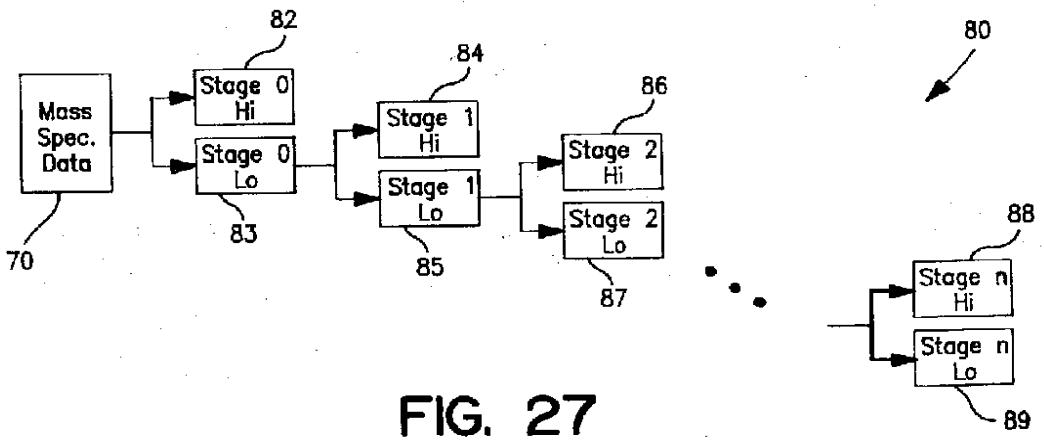

82
84
86
80
Mass Spec. Data
Stage 0 Hi
Stage 0 Lo
Stage 1 Hi
Stage 1 Lo
Stage 2 Hi
Stage 2 Lo
Stage n Hi
Stage n Lo
88
70
83
85
87
89

FIG. 27

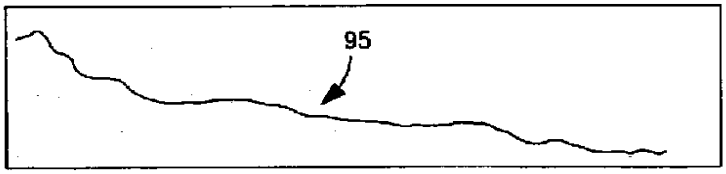
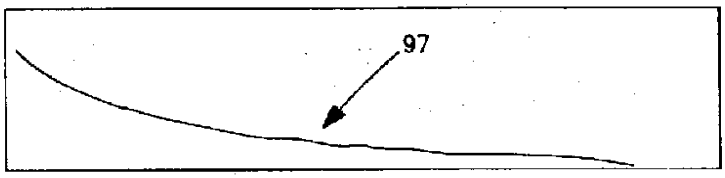


FIG. 28



Exp fitting
$a_0 + a_1 \exp^{-}(a_2 m)$

FIG. 29

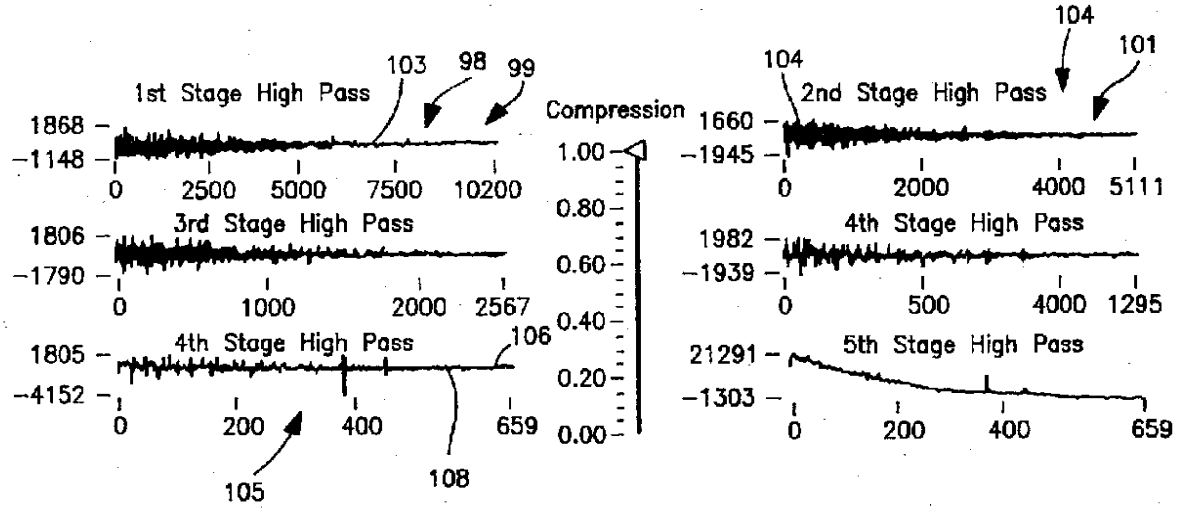


FIG. 30

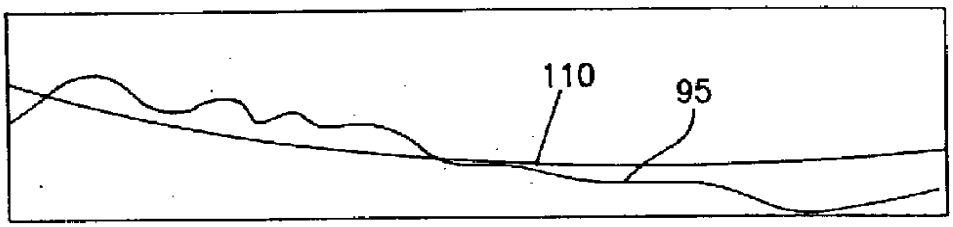

Stage 0 – Hi
110
95
Threshold 0=4XNoiseProfile
103
112
Stage 1 – Hi
Threshold 1=2XNoiseProfile
104
114
Stage 2 – Hi
Threshold 2=1XNoiseProfile
108
116
Stage n – Hi
Threshold n=(1/2 n−2)XNoiseProfile
Stage n – Lo
118

FIG. 31

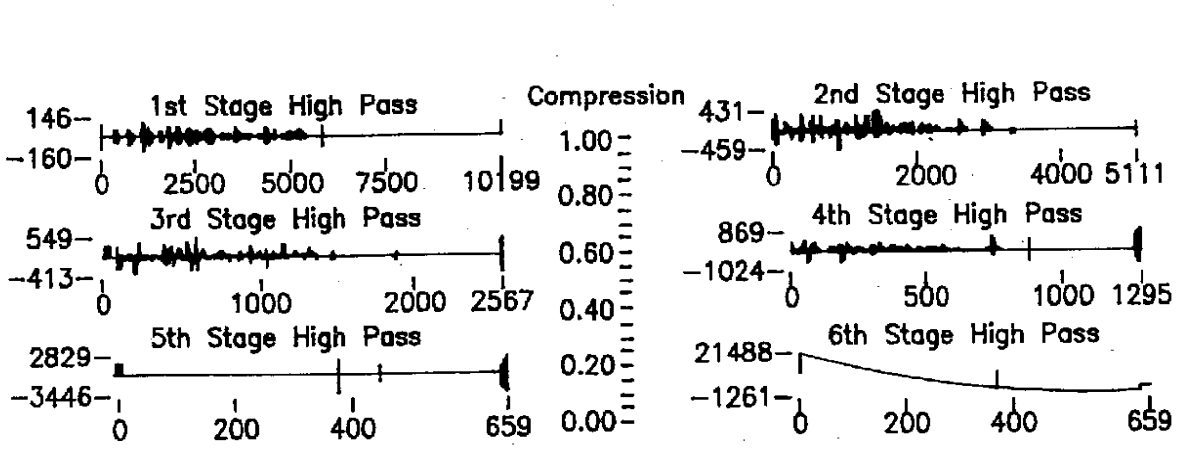


FIG. 32

$$\text{Signal (t)} = \frac{(\text{Start } 0(t) + \text{Start } 1(t) + \text{Start } 2(t) \ldots + \text{Start } 23\ (t))}{24}$$

SHIFT SIGNAL TO ACCOUNT FOR VARIATIONS DUE TO STARTING POINT

FIG. 33

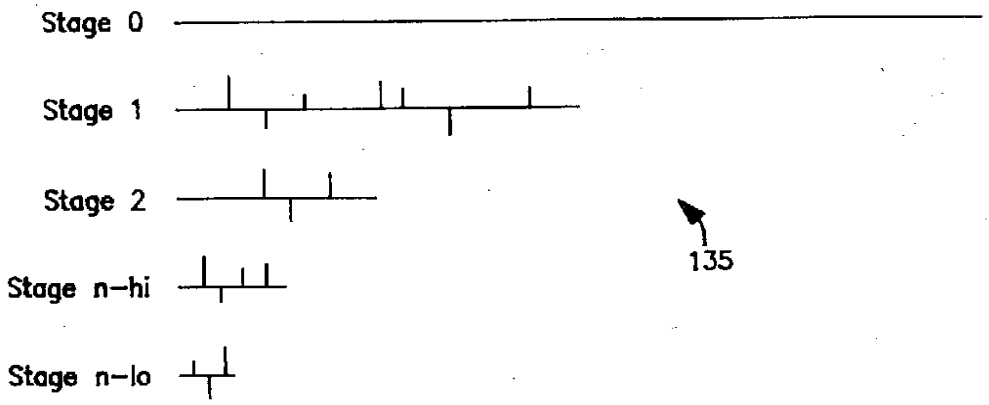


FIG. 34

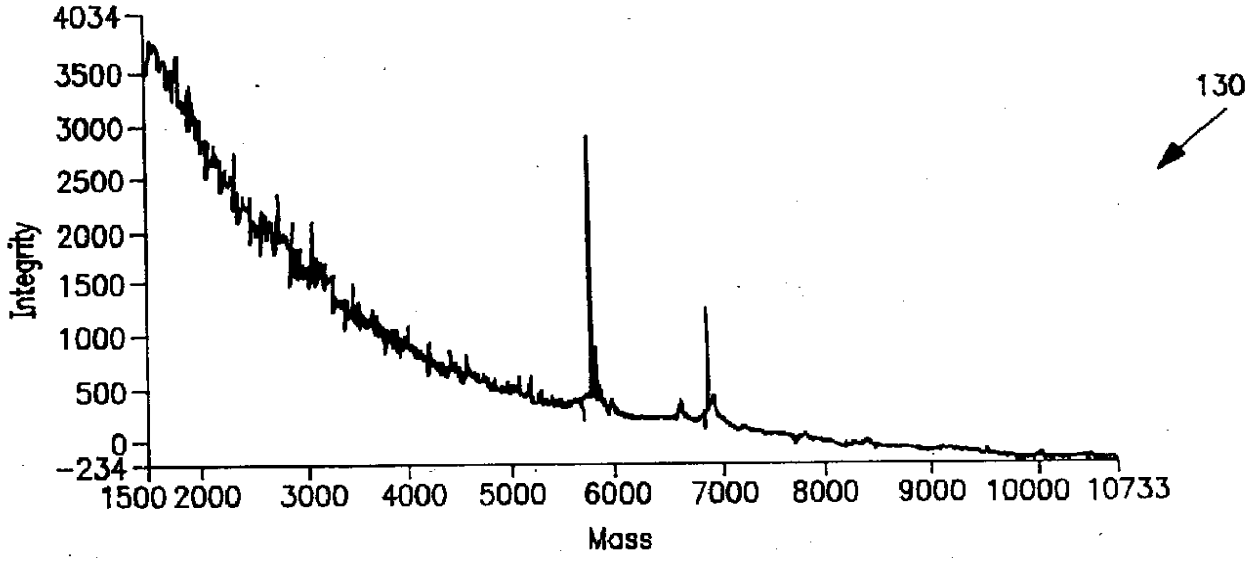


FIG. 35

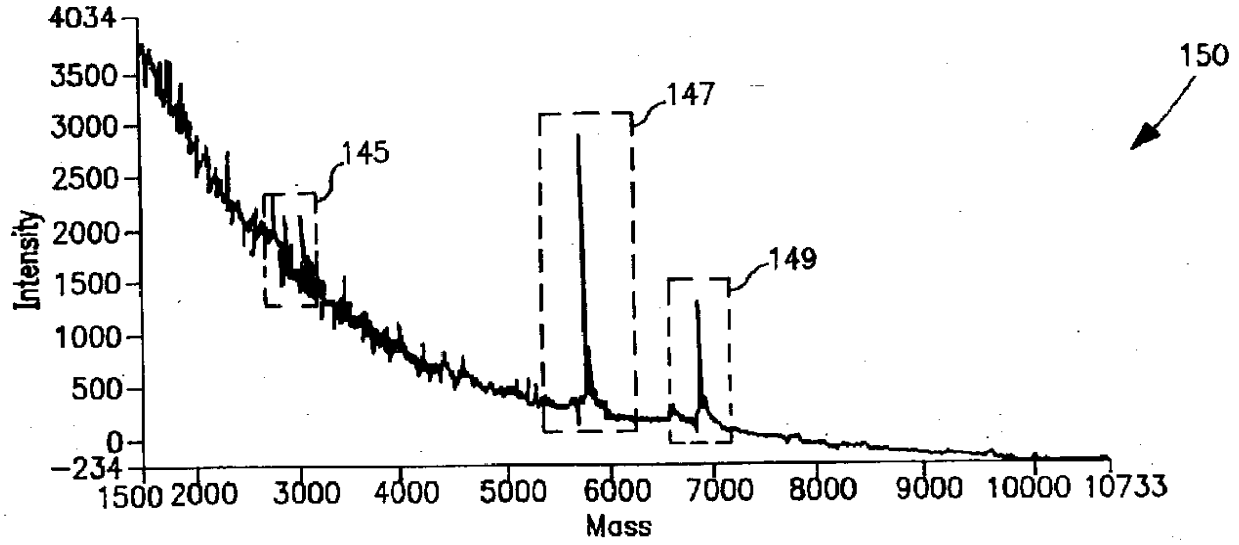


FIG. 13—TAKE A MOVING AVERAGE, REMOVE SECTIONS EXCEEDING A THRESHOLD

FIG. 36

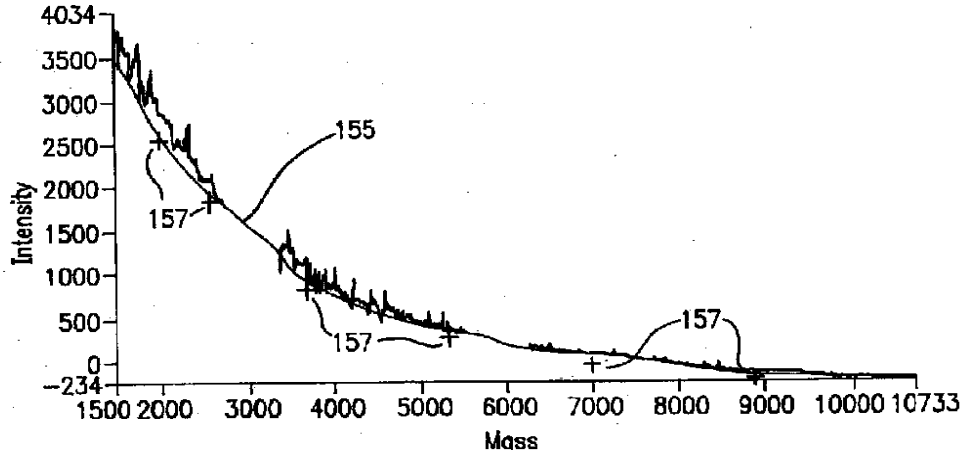


FIG. 37

FIND MINIMA IN REMAINING SIGNALS AND CONNECT TO FORM A PEAK FREE SIGNAL

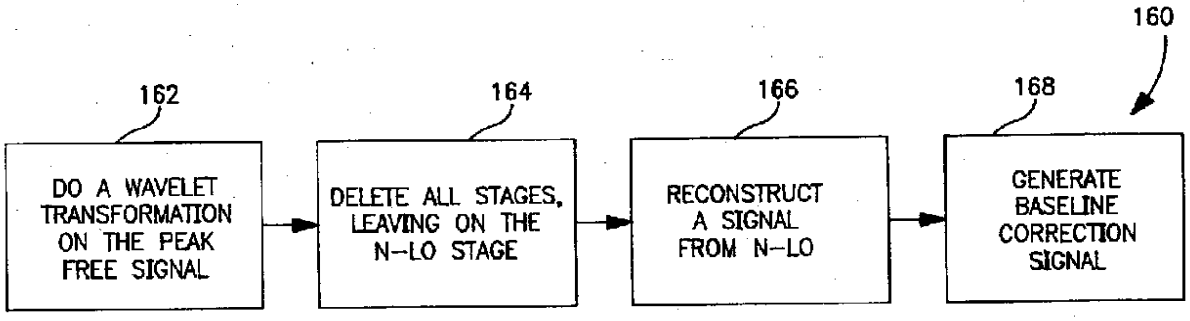


FIG. 38

GENRATE BASLELINE CORRECTION

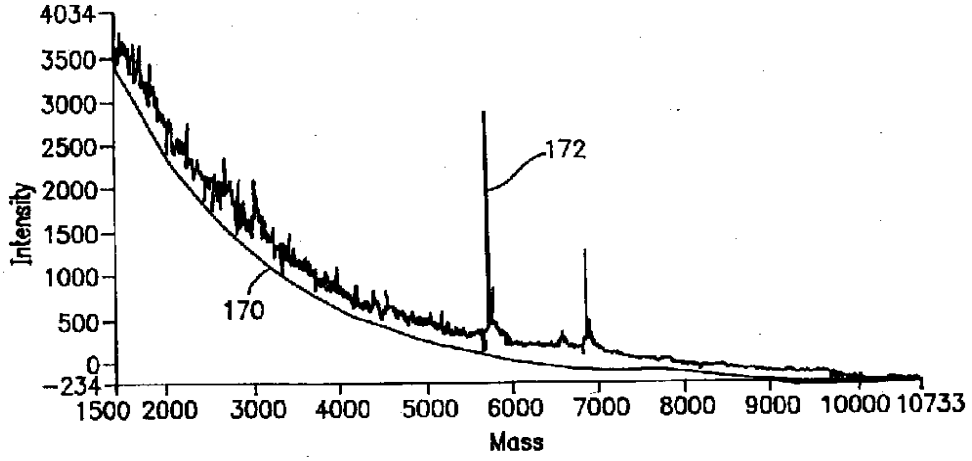


FIG. 39

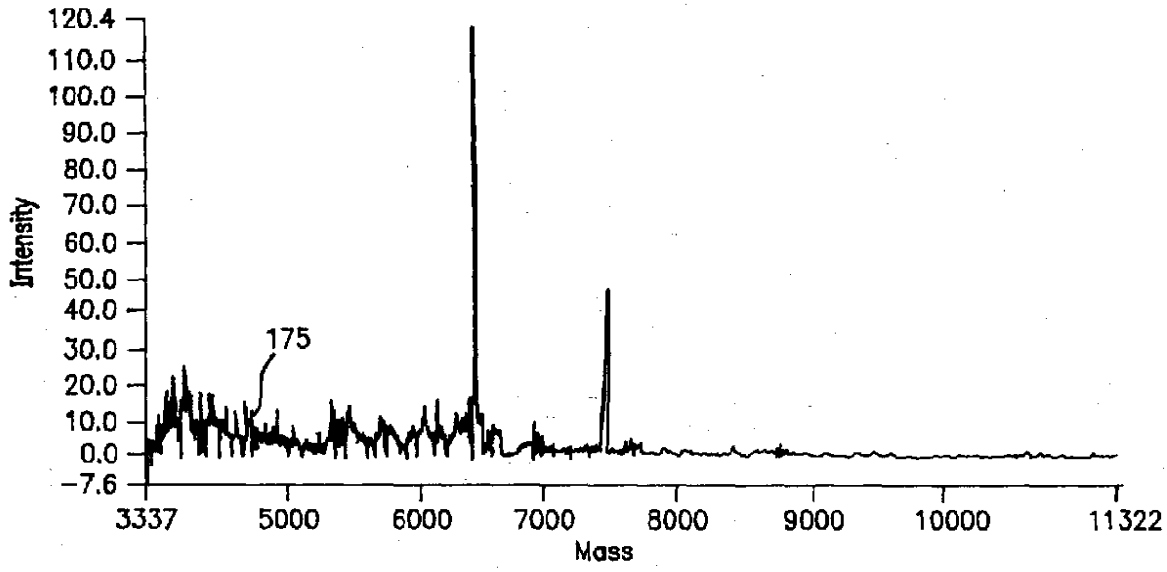

120.4
110.0
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
-7.6
Intensity
175
3337
5000
6000
7000
8000
9000
10000
11322
Mass

FIG. 40

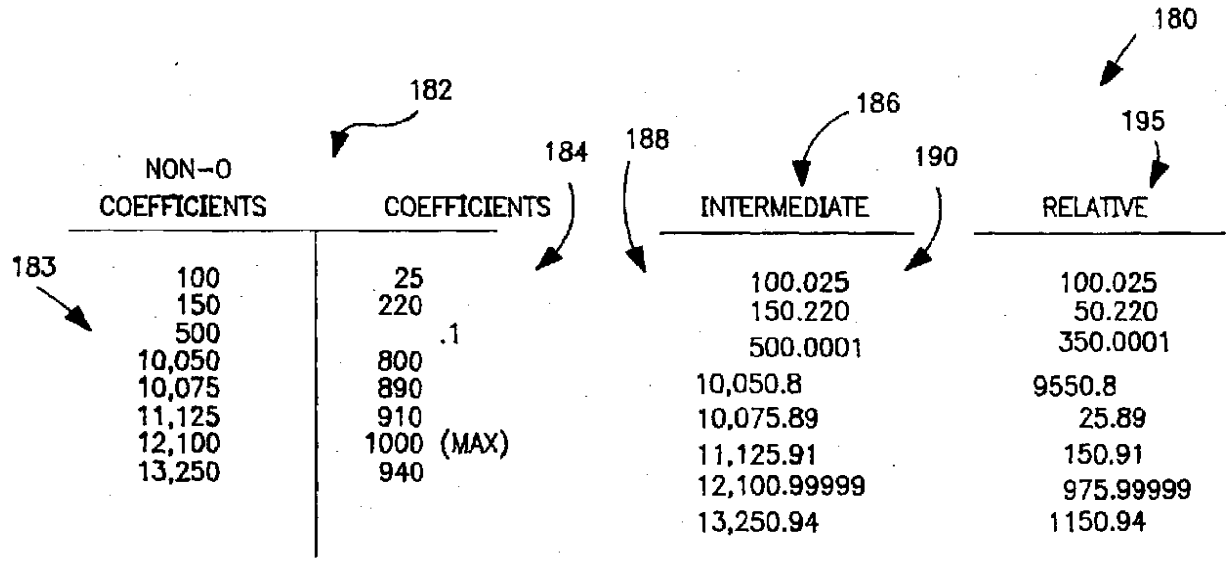

180
182
186
195
184
188
190
183
NON-0 COEFFICIENTS
COEFFICIENTS
INTERMEDIATE
RELATIVE
100
150
500
10,050
10,075
11,125
12,100
13,250
25
220
.1
800
890
910
1000 (MAX)
940
100.025
150.220
500.0001
10,050.8
10,075.89
11,125.91
12,100.99999
13,250.94
100.025
50.220
350.0001
9550.8
25.89
150.91
975.99999
1150.94

FIG. 41

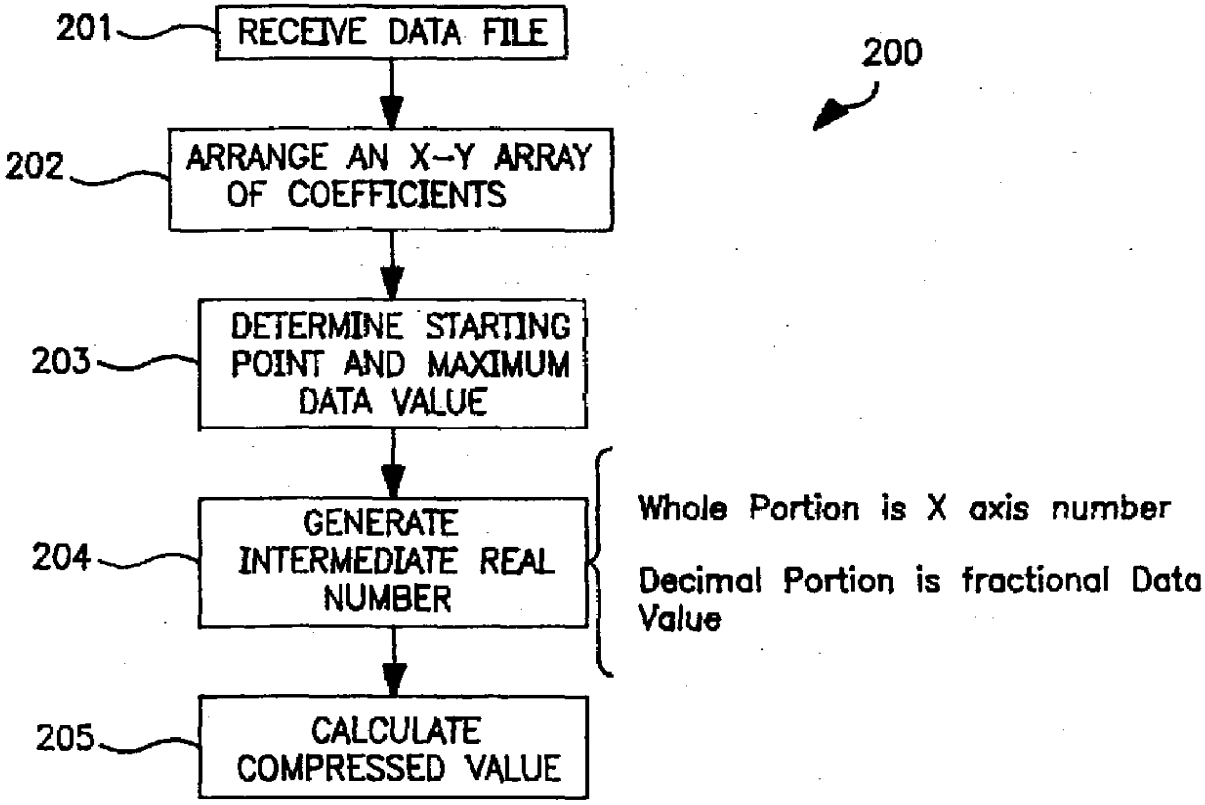

201
RECEIVE DATA FILE
200
202
ARRANGE AN X-Y ARRAY OF COEFFICIENTS
203
DETERMINE STARTING POINT AND MAXIMUM DATA VALUE
204
GENERATE INTERMEDIATE REAL NUMBER
Whole Portion is X axis number
Decimal Portion is fractional Data Value
205
CALCULATE COMPRESSED VALUE

FIG. 42

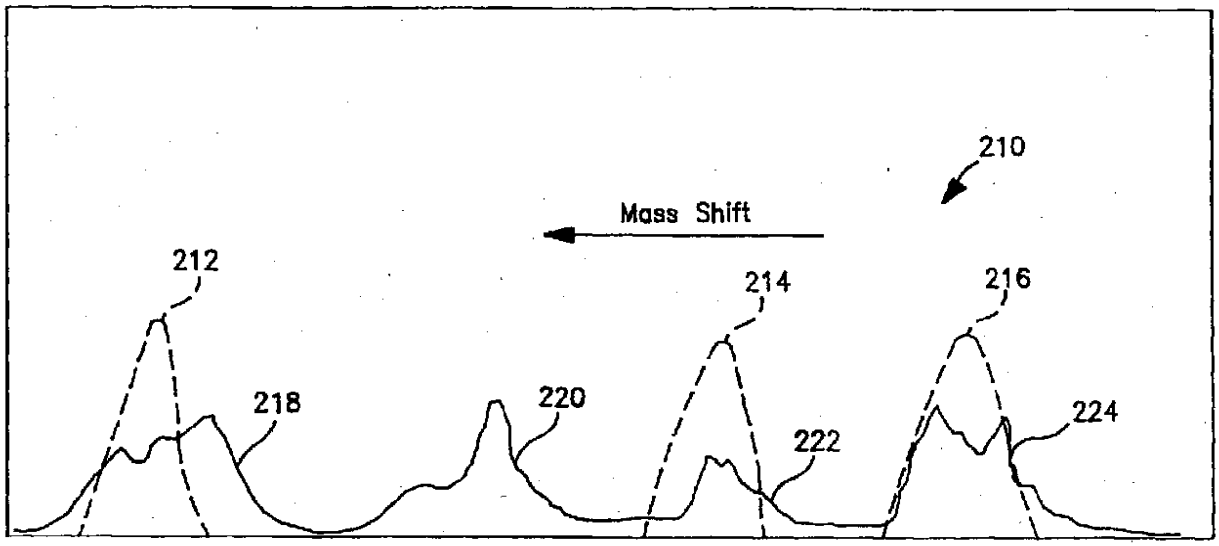


FIG. 43

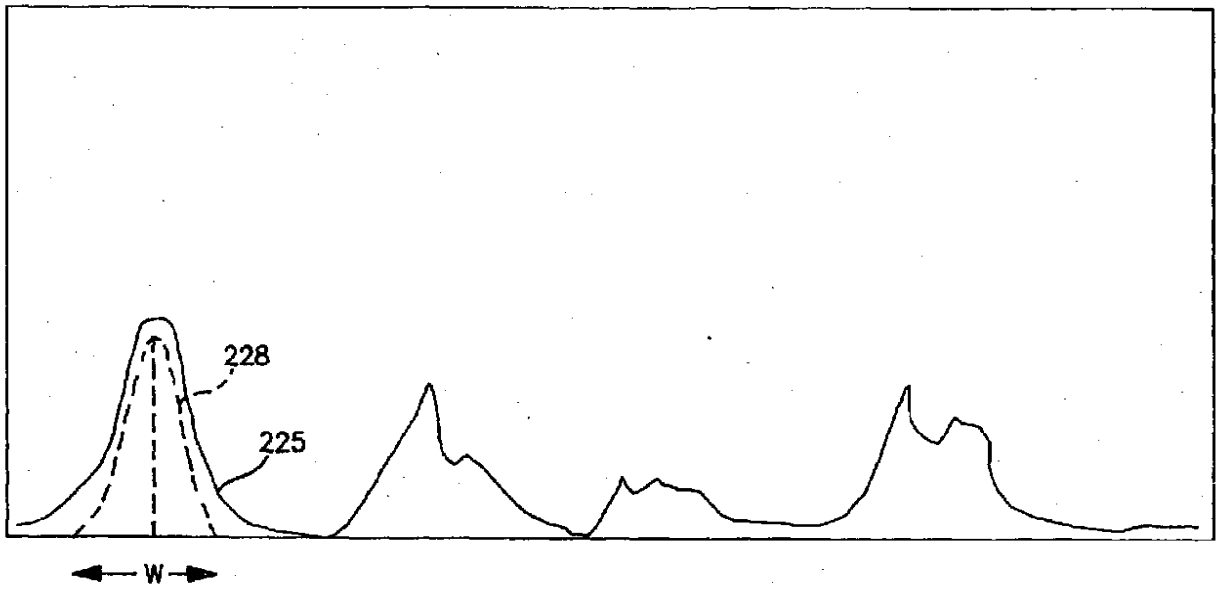


FIG. 44

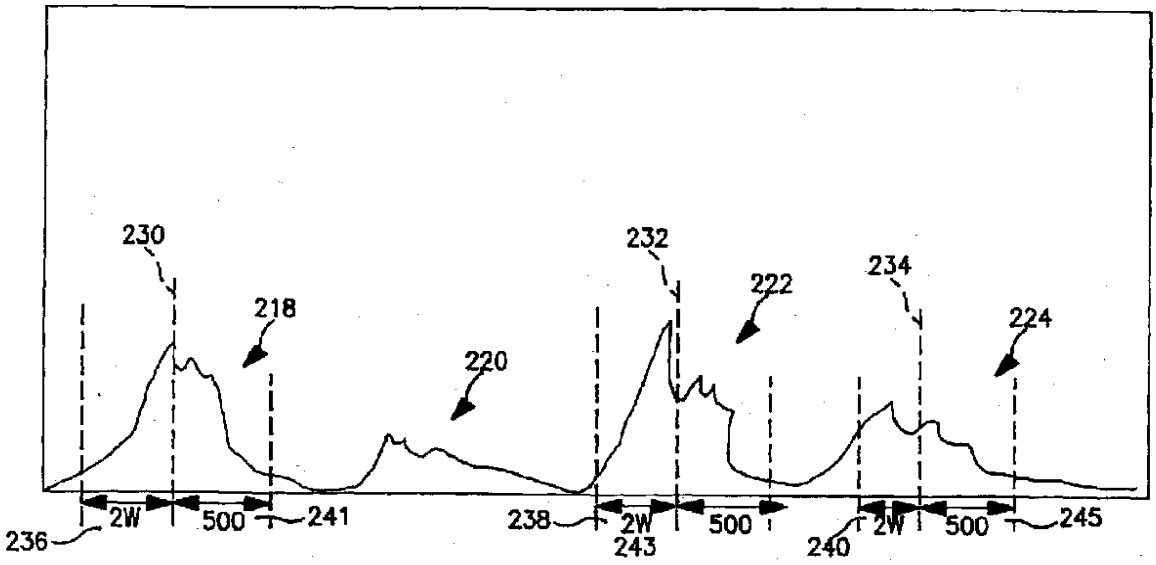


FIG. 45

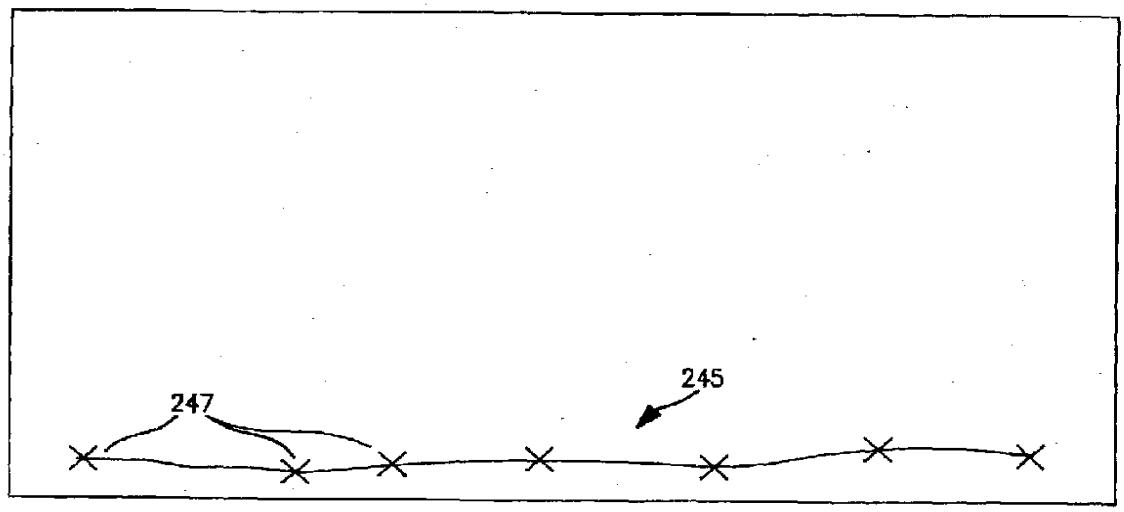


FIG. 46

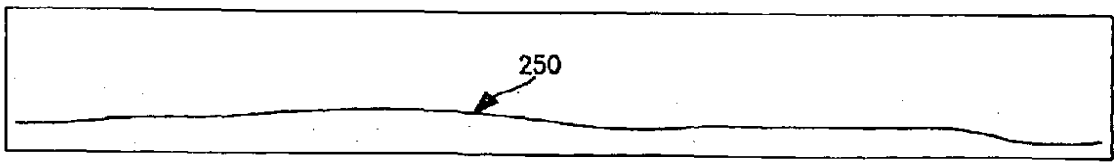


FIG. 47

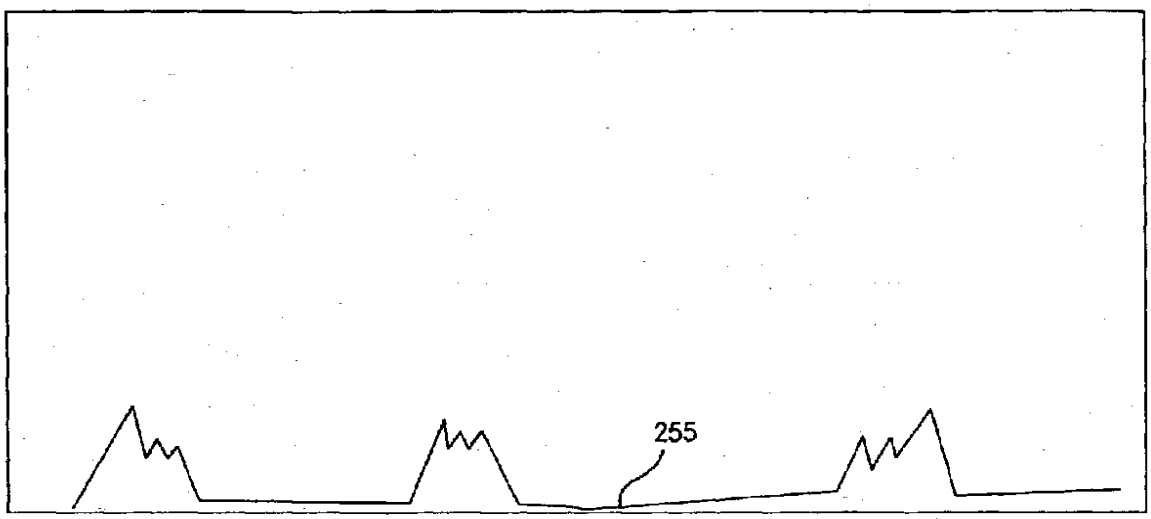


FIG. 48

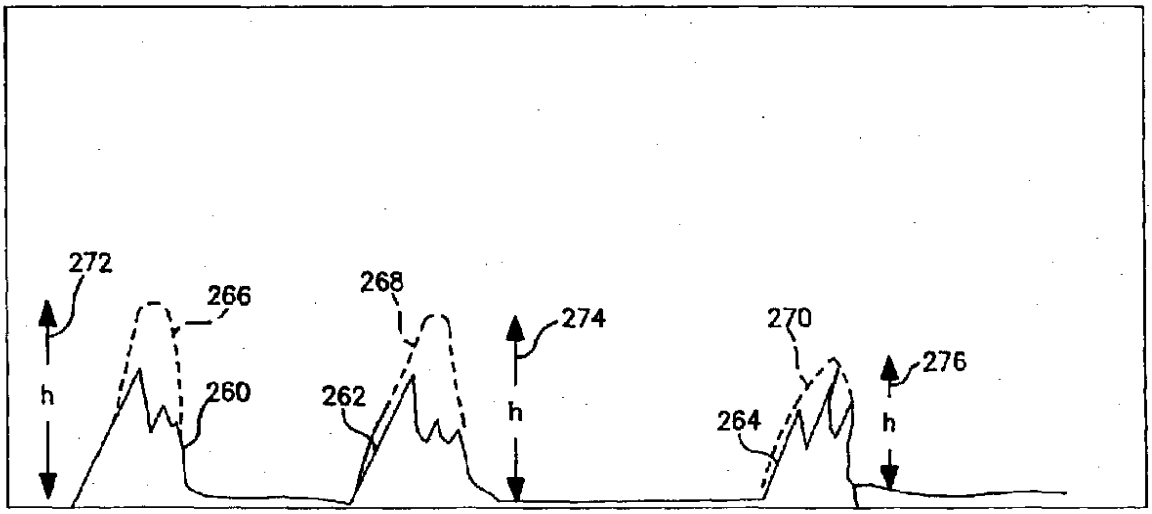


FIG. 49

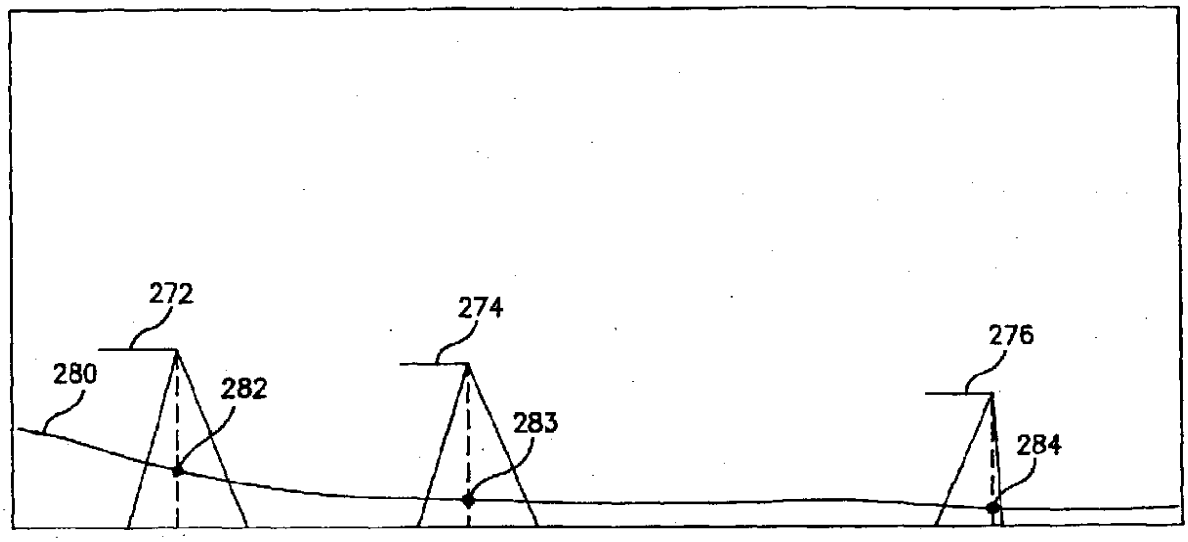


FIG. 50

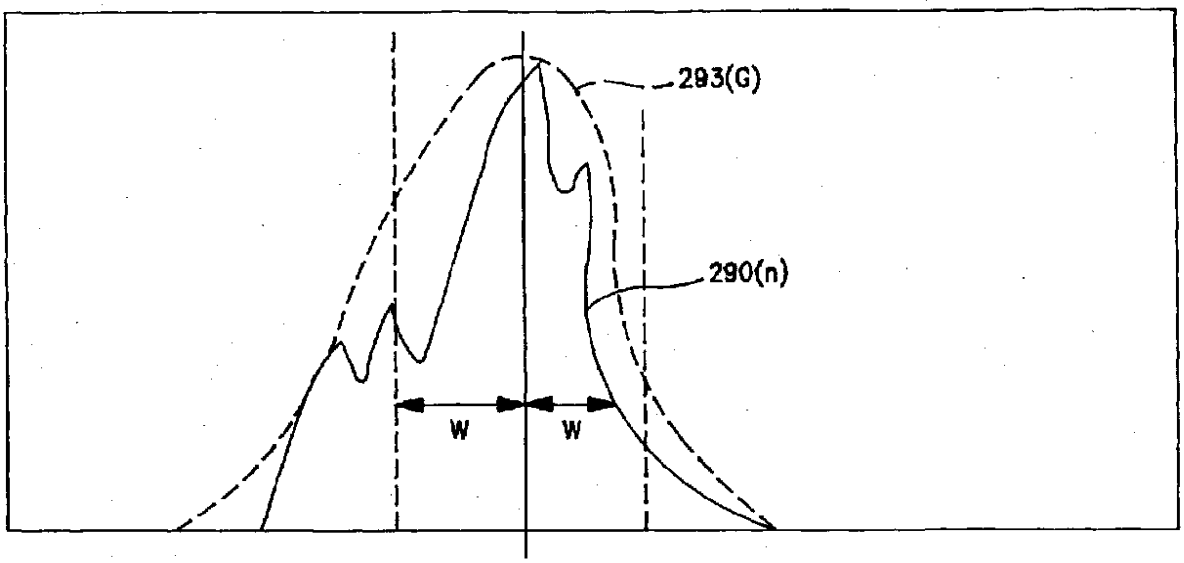


FIG. 51

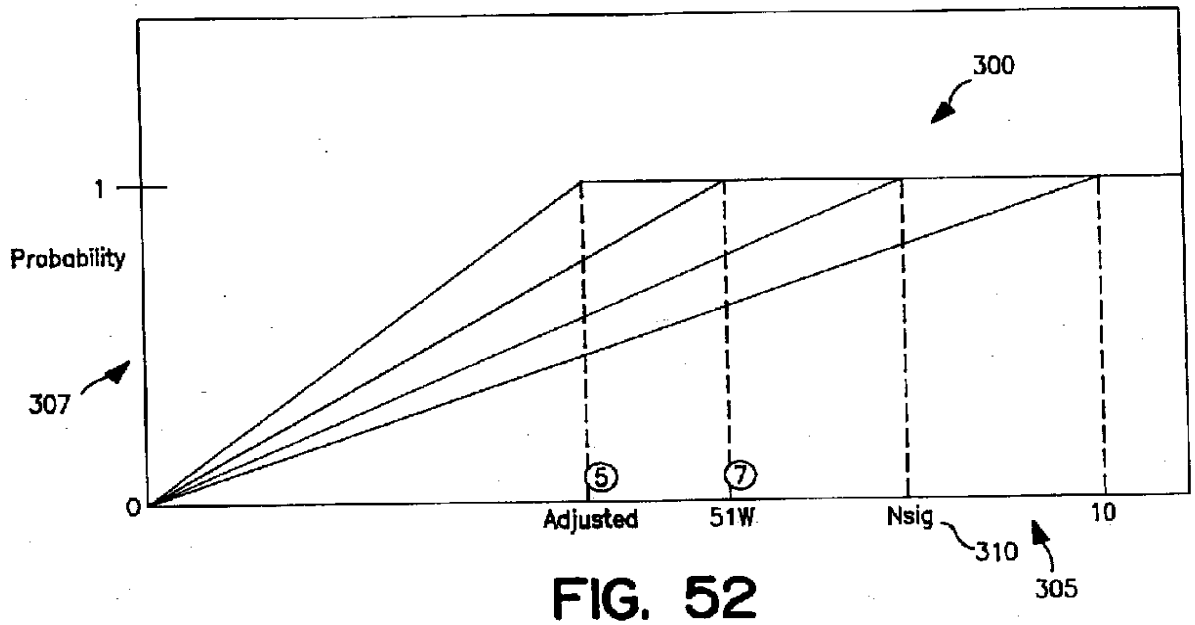

300
1
Probability
307
0
5
7
Adjusted
51W
Nsig
10
310
305

FIG. 52

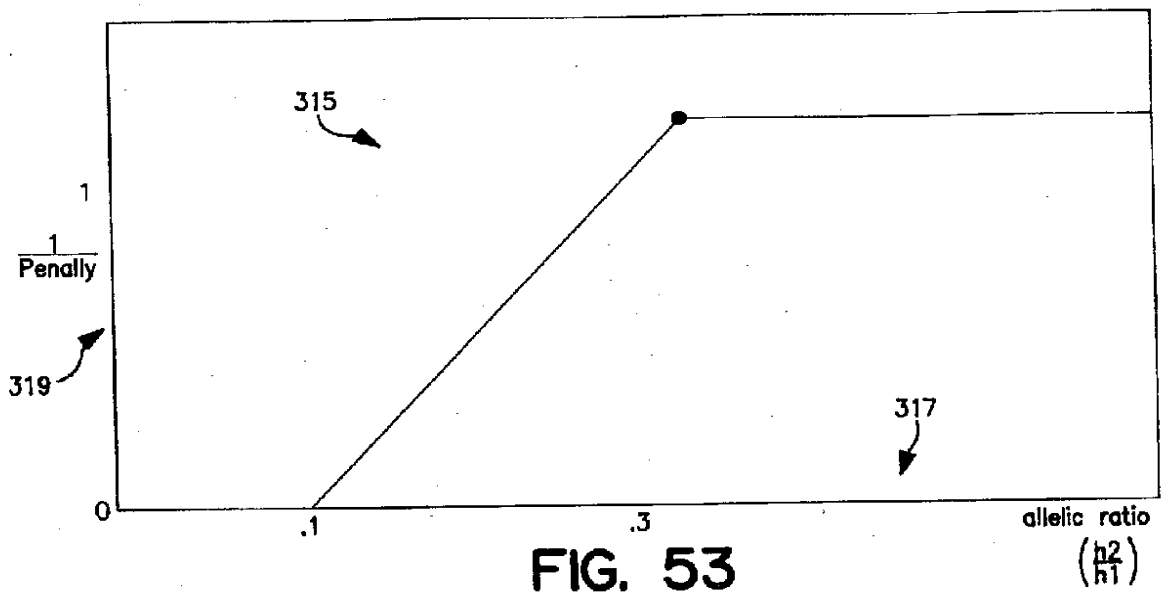

315
1
1
Penalty
319
0
317
.1
.3
allelic ratio
(h2/h1)

FIG. 53

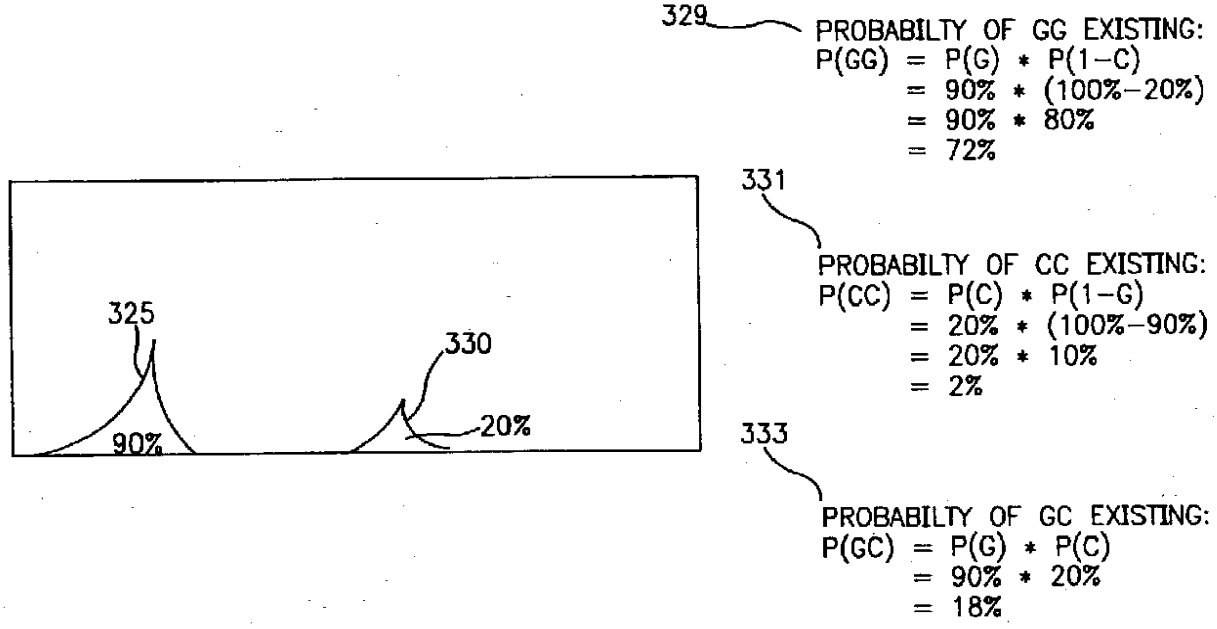

329
PROBABILTY OF GG EXISTING:
P(GG) = P(G) * P(1−C)
= 90% * (100%−20%)
= 90% * 80%
= 72%
331
PROBABILTY OF CC EXISTING:
P(CC) = P(C) * P(1−G)
= 20% * (100%−90%)
= 20% * 10%
= 2%
333
PROBABILTY OF GC EXISTING:
P(GC) = P(G) * P(C)
= 90% * 20%
= 18%
325
330
90%
20%

FIG. 54

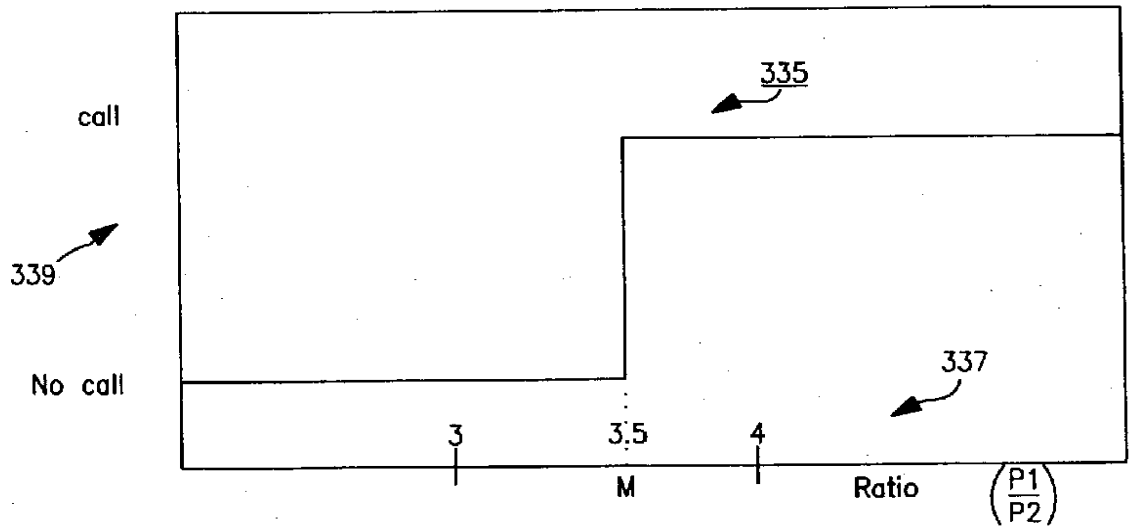

335
call
339
No call
337
3
3.5
4
M
Ratio
(P1/P2)

FIG. 55

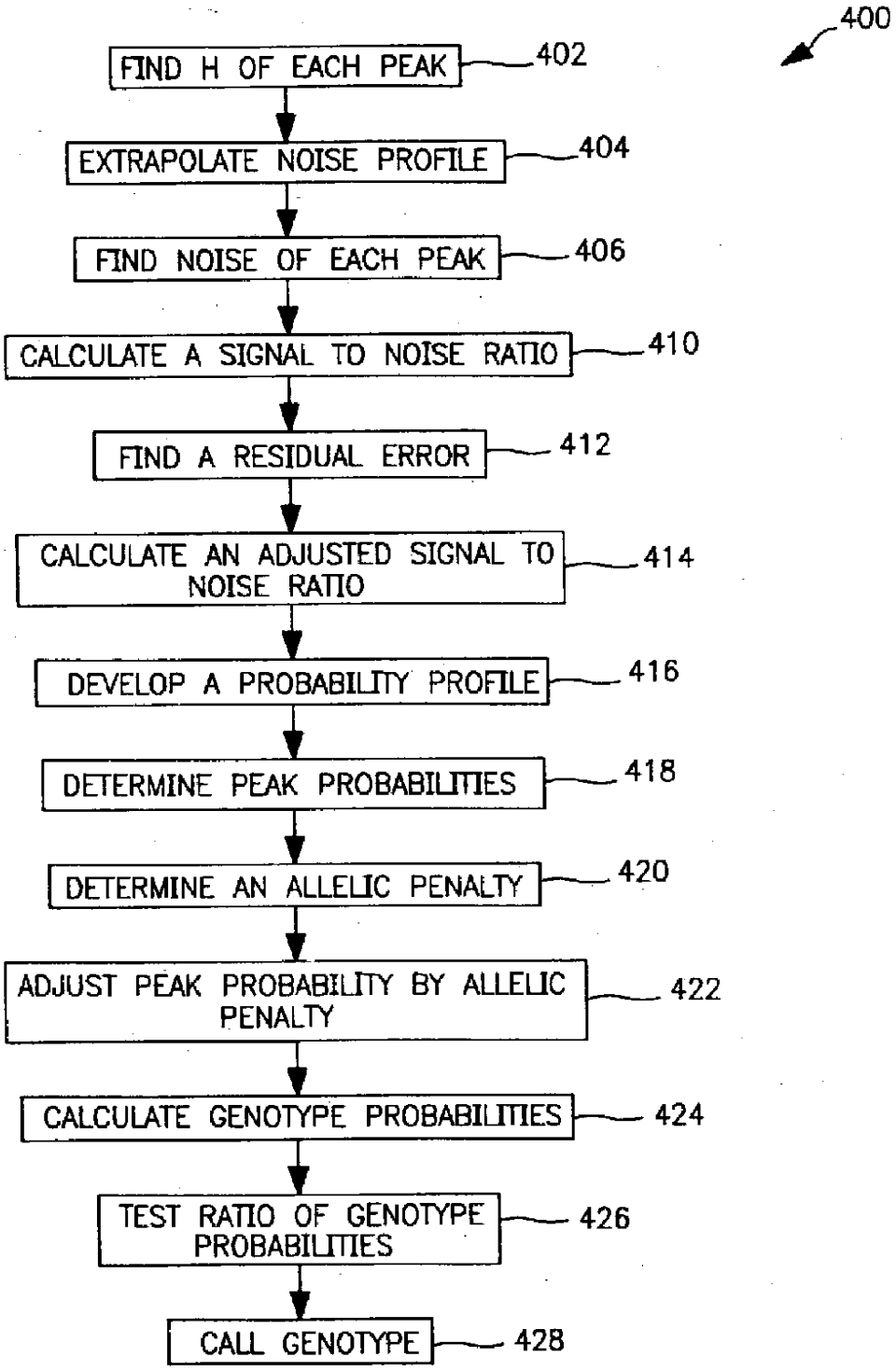

400
FIND H OF EACH PEAK
402
EXTRAPOLATE NOISE PROFILE
404
FIND NOISE OF EACH PEAK
406
CALCULATE A SIGNAL TO NOISE RATIO
410
FIND A RESIDUAL ERROR
412
CALCULATE AN ADJUSTED SIGNAL TO NOISE RATIO
414
DEVELOP A PROBABILITY PROFILE
416
DETERMINE PEAK PROBABILITIES
418
DETERMINE AN ALLELIC PENALTY
420
ADJUST PEAK PROBABILITY BY ALLELIC PENALTY
422
CALCULATE GENOTYPE PROBABILITIES
424
TEST RATIO OF GENOTYPE PROBABILITIES
426
CALL GENOTYPE
428

FIG. 56

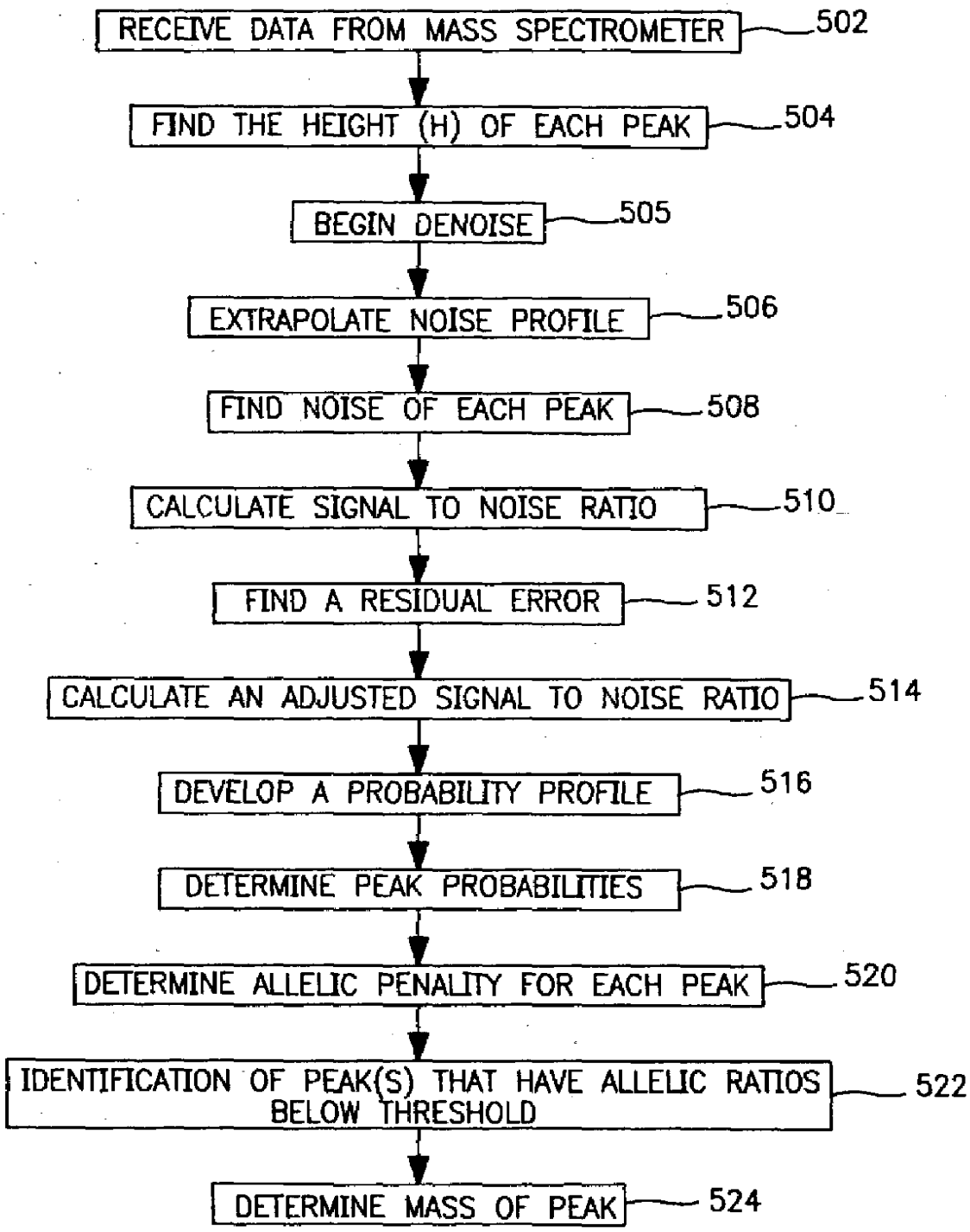

RECEIVE DATA FROM MASS SPECTROMETER
502
FIND THE HEIGHT (H) OF EACH PEAK
504
BEGIN DENOISE
505
EXTRAPOLATE NOISE PROFILE
506
FIND NOISE OF EACH PEAK
508
CALCULATE SIGNAL TO NOISE RATIO
510
FIND A RESIDUAL ERROR
512
CALCULATE AN ADJUSTED SIGNAL TO NOISE RATIO
514
DEVELOP A PROBABILITY PROFILE
516
DETERMINE PEAK PROBABILITIES
518
DETERMINE ALLELIC PENALITY FOR EACH PEAK
520
IDENTIFICATION OF PEAK(S) THAT HAVE ALLELIC RATIOS BELOW THRESHOLD
522
DETERMINE MASS OF PEAK
524

FIG. 57

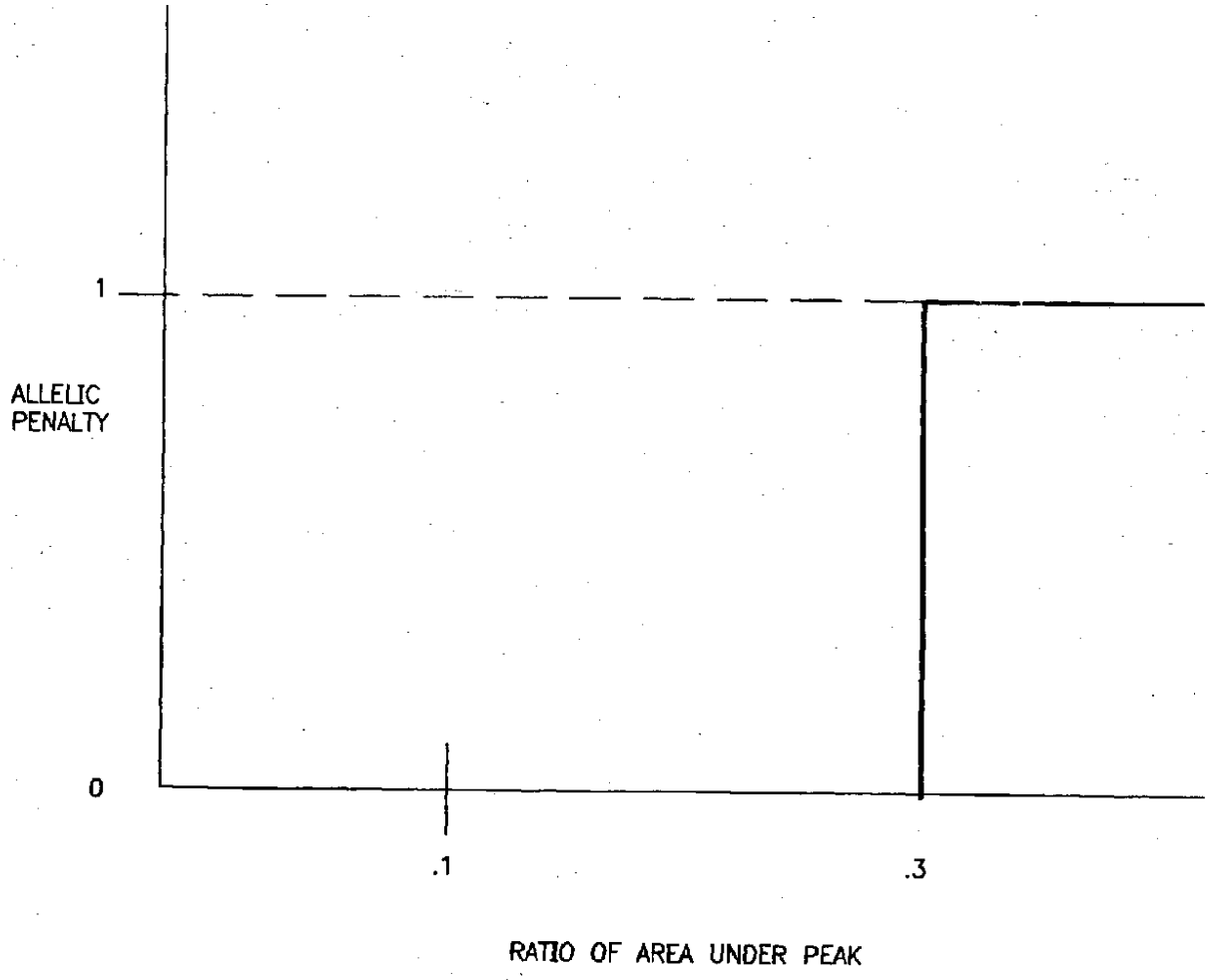


FIG. 58

METHODS FOR GENERATING DATABASES AND DATABASES FOR IDENTIFYING POLYMORPHIC GENETIC MARKERS

RELATED APPLICATIONS

[0001] This application is a divisional application of copending U.S. patent application Ser. No. 09/687,483, filed Oct. 13, 2000, to Andreas Braun, Hubert Koster, Dirk Van den Boom, Yip Ping, Charles Rodi, Liyan He, Norman Chiu and Christian Jurinke entitled "METHODS FOR GENERATING DATABASES AND DATABASES FOR IDENTIFYING POLYMORPHIC GENETIC MARKERS."

[0002] Benefit of priority under 35 U.S.C. §119(e) to the following provisional applications is claimed herein: U.S. provisional application Serial No. 60/217,658 to Andreas Braun, Hubert Koster; Dirk Van den Boom, filed Jul. 10, 2000, entitled "METHODS FOR GENERATING DATABASES AND DATABASES FOR IDENTIFYING POLYMORPHIC GENETIC MARKERS"; U.S. provisional application Serial No. 60/159,176 to Andreas Braun, Hubert Koster, Dirk Van den Boom, filed Oct. 13, 1999, entitled "METHODS FOR GENERATING DATABASES AND DATABASES FOR IDENTIFYING POLYMORPHIC GENETIC MARKERS"; U.S. provisional application Serial No. 60/217,251, filed Jul. 10, 2000, to Andreas Braun, entitled "POLYMORPHIC KINASE ANCHOR PROTEIN GENE SEQUENCES, POLYMORPHIC KINASE ANCHOR PROTEINS AND METHODS OF DETECTING POLYMORPHIC KINASE ANCHOR PROTEINS AND NUCLEIC ACIDS ENCODING THE SAME". This application is also a continuation-in-part of U.S. application Serial No. 09/663,968, to Ping Yip, filed Sep. 19, 2000, entitled "METHOD AND DEVICE FOR IDENTIFYING A BIOLOGICAL SAMPLE."

[0003] The above-noted applications and provisional applications are incorporated by reference in their entirety.

FIELD OF THE INVENTION

[0004] Process and methods for creating a database of genomic samples from healthy human donors. Methods that use the database to identify and correlate with polymorphic genetic markers and other markers with diseases and conditions are provided.

BACKGROUND

[0005] Diseases in all organisms have a genetic component, whether inherited or resulting from the body's response to environmental stresses, such as viruses and toxins. The ultimate goal of ongoing genomic research is to use this information to develop new ways to identify, treat and potentially cure these diseases. The first step has been to screen disease tissue and identify genomic changes at the level of individual samples. The identification of these "disease" markers has then fueled the development and commercialization of diagnostic tests that detect these errant genes or polymorphisms. With the increasing numbers of genetic markers, including single nucleotide polymorphisms (SNPs), microsatellites, tandem repeats, newly mapped introns and exons, the challenge to the medical and pharmaceutical communities is to identify genotypes which not only identify the disease but also follow the progression of the disease and are predictive of an organism's response to treatment.

[0006] Currently the pharmaceutical and biotechnology industries find a disease and then attempt to determine the genomic basis for the disease. This approach is time consuming and expensive and in many cases involves the investigator guessing as to what pathways might be involved in the disease.

[0007] Genomics

[0008] Presently the two main strategies employed in analyzing the available genomic information are the technology driven reverse genetics brute force strategy and the knowledge-based pathway oriented forward genetics strategy. The brute force approach yields large databases of sequence information but little information about the medical or other uses of the sequence information. Hence this strategy yields intangible products of questionable value. The knowledge-based strategy yields small databases that contain a lot of information about medical uses of particular DNA sequences and other products in the pathway and yield tangible products with a high value.

[0009] Polymorphisms

[0010] Polymorphisms have been known since 1901 with the identification of blood types. In the 1950's they were identified on the level of proteins using large population genetic studies. In the 1980's and 1990's many of the known protein polymorphisms were correlated with genetic loci on genomic DNA. For example, the gene dose of the apolipoprotein E type 4 allele was correlated with the risk of Alzheimer's disease in late onset families (see, e.g., Corder et al. (1993) *Science* 261: 921-923; mutation in blood coagulation factor V was associated with resistance to activated protein C (see, e.g., Bertina et al. (1994) *Nature* 369:64-67); resistance to HIV-1 infection has been shown in Caucasian individuals bearing mutant alleles of the CCR-5 chemokine receptor gene (see, e.g., Samson et al. (1996) *Nature* 382:722-725); and a hypermutable tract in antigen presenting cells (APC, such as macrophages), has been identified in familial colorectal cancer in individuals of Ashkenzi jewish background (see, e.g., Laken et al. (1997) *Nature Genet.* 17:79-83). There can be more than three million polymorphic sites in the human genome. Many have been identified, but not yet characterized or mapped or associated with a marker.

[0011] Single Nucleotide Polymorphisms (SNPs)

[0012] Much of the focus of genomics has been in the identification of SNPs, which are important for a variety of reasons. They allow indirect testing (association of haplotypes) and direct testing (functional variants). They are the most abundant and stable genetic markers. Common diseases are best explained by common genetic alterations, and the natural variation in the human population aids in understanding disease, therapy and environmental interactions.

[0013] Currently, the only available method to identify SNPs in DNA is by sequencing, which is expensive, difficult and laborious. Furthermore, once a SNP is discovered it must be validated to determine if it is a real polymorphism and not a sequencing error. Also, discovered SNPs must then be evaluated to determine if they are associated with a particular phenotype. Thus, there is a need to develop new paradigms for identifying the genomic basis for disease and markers thereof. Therefore, it is an object herein to provide methods for identifying the genomic basis of disease and markers thereof.

SUMMARY

[0014] Databases and methods using the databases are provided herein. The databases comprise sets of parameters associated with subjects in populations selected only on the basis of being healthy (i.e., where the subjects are mammals, such as humans, they are selected based upon apparent health and no detectable infections). The databases can be sorted based upon one or more of the selected parameters.

[0015] The databases, for example, can be relational databases, in which an index that represents each subject serves to relate parameters, which are the data, such as age, ethnicity, sex, medical history, etc. and ultimately genotypic information, that was inputted into and stored in the database. The database can then be sorted according to these parameters. Initially, the parameter information is obtained from a questionnaire answered by each subject from whom a body tissue or body fluid sample is obtained. As additional information about each sample is obtained, this information can be entered into the database and can serve as a sorting parameter.

[0016] The databases obtained from healthy individuals have numerous uses, such as correlating known polymorphisms with a phenotype or disease. The databases can be used to identify alleles that are deleterious, that are beneficial, and that are correlated with diseases.

[0017] For purposes herein, genotypic information can be obtained by any method known to those of skill in the art, but is generally obtained using mass spectrometry.

[0018] Also provided herein, is a new use for existing databases of subjects and genotypic and other parameters, such as age, ethnicity, race, and gender. Any database can be sorted according to the methods herein, and alleles that exhibit statistically significant correlations with any of the sorting parameters can be identified. It is noted, however, is noted, that the databases provided herein and randomly selected databases will perform better in these methods, since disease-based databases suffer numerous limitations, including their relatively small size, the homogeneity of the selected disease population, and the masking effect of the polymorphism associated with the markers for which the database was selected. Hence, the healthy database provided herein, provides advantages not heretofore recognized or exploited. The methods provided herein can be used with a selected database, including disease-based databases, with or without sorting for the discovery and correlation of polymorphisms. In addition, the databases provided herein represent a greater genetic diversity than the unselected databases typically utilized for the discovery of polymorphisms and thus allow for the enhanced discovery and correlation of polymorphisms.

[0019] The databases provided herein can be used for taking an identified polymorphism and ascertaining whether it changes in frequency when the data are sorted according to a selected parameter.

[0020] One use of these methods is correlating a selected marker with a particular parameter by following the occurrence of known genetic markers and then, having made this correlation, determining or identifying correlations with diseases. Examples of this use are p53 and Lipoprotein Lipase polymorphism. As exemplified herein, known markers are shown to have particular correlation with certain groups, such as a particular ethnicity or race or one sex. Such correlations will then permit development of better diagnostic tests and treatment regimens.

[0021] These methods are valuable for identifying one or more genetic markers whose frequency changes within the population as a function of age, ethnic group, sex or some other criteria. This can allow the identification of previously unknown polymorphisms and ultimately a gene or pathway involved in the onset and progression of disease.

[0022] The databases and methods provided herein permit, among other things, identification of components, particularly key components, of a disease process by understanding its genetic underpinnings and also permit an understanding of processes, such as individual drug responses. The databases and methods provided herein also can be used in methods involving elucidation of pathological pathways, in developing new diagnostic assays, identifying new potential drug targets, and in identifying new drug candidates.

[0023] The methods and databases can be used with experimental procedures, including, but are not limited to, in silico SNP identification, in vitro SNP identification/verification, genetic profiling of large populations, and in biostatistical analyses and interpretations.

[0024] Also provided herein, are combinations that contain a database provided herein and a biological sample from a subject in the database, and typically biological samples from all subjects or a plurality of subjects in the database. Collections of the tissue and body fluid samples are also provided.

[0025] Also, provided herein, are methods for determining a genetic marker that correlates with age, comprising identifying a polymorphism and determining the frequency of the polymorphism with increasing age in a healthy population.

[0026] Further provided herein are methods for determining whether a genetic marker correlates with susceptibility to morbidity, early mortality, or morbidity and early mortality, comprising identifying a polymorphism and determining the frequency of the polymorphism with increasing age in a healthy population.

[0027] Any of the methods herein described can be used out in a multiplex format.

[0028] Also provided are an apparatus and process for accurately identifying genetic information. It is another object herein that genetic information be extracted from genetic data in a highly automated manner. Therefore, to overcome the deficiencies in the known conventional systems, methods and apparatus for identifying a biological sample are provided.

[0029] Briefly, the method and system for identifying a biological sample generates a data set indicative of the composition of the biological sample. In a particular example, the data set is DNA spectrometry data received from a mass spectrometer. The data set is denoised, and a baseline is deleted. Since possible compositions of the biological sample can be known, expected peak areas can be determined. Using the expected peak areas, a residual baseline is generated to further correct the data set. Probable peaks are then identifiable in the corrected data set, which are used to identify the composition of the biological

sample. In a disclosed example, statistical methods are employed to determine the probability that a probable peak is an actual peak, not an actual peak, or that the data too inconclusive to call.

[0030] Advantageously, the method and system for identifying a biological sample accurately makes composition calls in a highly automated manner. In such a manner, complete SNP profile information, for example, can be collected efficiently. More importantly, the collected data are analyzed with highly accurate results. For example, when a particular composition is called, the result can be relied upon with great confidence. Such confidence is provided by the robust computational process employed.

DESCRIPTION OF THE DRAWINGS

[0031] **FIG. 1** depicts an exemplary sample bank. Panel 1 shows the samples as a function of sex and ethnicity. Panel 2 shows the Caucasians as a function of age. Panel 3 shows the Hispanics as a function of age.

[0032] **FIGS. 2A and 2C** show an age- and sex-distribution of the 291S allele of the lipoprotein lipase gene in which a total of 436 males and 589 females were investigated. **FIG. 2B** shows an age distribution for the 436 males.

[0033] **FIG. 3** is an exemplary questionnaire for population-based sample banking.

[0034] **FIG. 4** depicts processing and tracking of blood sample components.

[0035] **FIG. 5** depicts the allelic frequency of "sick" alleles and "healthy" alleles as a function of age. It is noted that the relative frequency of healthy alleles increases in a population with increasing age.

[0036] **FIG. 6** depicts the age-dependent distribution of ApoE genotypes (see, Schächter et al. (1994) *Nature Genetics* 6:29-32).

[0037] FIGS. **7A-D** depicts age-related and genotype frequency of the p53 (tumor suppressor) codon 72 among the Caucasian population in the database. *R72 and *P72 represent the frequency of the allele in the database population. R72, R72P, and P72 represent the genotypes of the individuals in the population. The frequency of the homozygous P72 allele drops from 6.7% to 3.7% with age.

[0038] **FIG. 8** depicts the allele and genotype frequencies of the p21 S31R allele as a function of age.

[0039] **FIG. 9** depicts the frequency of the FVII Allele 353Q in pooled versus individual samples.

[0040] **FIG. 10** depicts the frequency of the CETP (cholesterol ester transfer protein) allele in pooled versus individual samples.

[0041] **FIG. 11** depicts the frequency of the plasminogen activator inhibitor-1 (PAI-1) 5G in pooled versus individual samples.

[0042] **FIG. 12** shows mass spectra of the samples and the ethnic diversity of the PAI-1 alleles.

[0043] **FIG. 13** shows mass spectra of the samples and the ethnic diversity of the CETP 405 alleles.

[0044] **FIG. 14** shows mass spectra of the samples and the ethnic diversity of the Factor VII 353 alleles.

[0045] **FIG. 15** shows ethnic diversity of PAI-1, CETP and Factor VII using the pooled DNA samples.

[0046] **FIG. 16** shows the p53-Rb pathway and the relationships among the various factors in the pathway.

[0047] **FIG. 17**, which is a block diagram of a computer constructed to provide and process the databases described herein, depicts a typical computer system for storing and sorting the databases provided herein and practicing the methods provided herein.

[0048] **FIG. 18** is a flow diagram that illustrates the processing steps performed using the computer illustrated in **FIG. 17**, to maintain and provide access to the databases for identifying polymorphic genetic markers.

[0049] **FIG. 19** is a histogram showing the allele and genotype distribution in the age and sex stratified Caucasian population for the AKAP10-1 locus. Bright green bars show frequencies in individuals younger than 40 years. Dark green bars show frequencies in individuals older than 60 years.

[0050] **FIG. 20** is a histogram showing the allele and genotype distribution in the age and sex stratified Caucasian population for the AKAP10-5 locus. Bright green bars show frequencies in individuals younger than 40 years; dark green bars show frequencies in individuals older than 60 years.

[0051] **FIG. 21** is a histogram showing the allele and genotype distribution in the age and sex stratified Caucasian population for the h-msrA locus. Genotype difference between male age groups is significant. Bright green bars show frequencies in individuals younger than 40 years. Dark green bars show frequencies in individuals older than 60 years.

[0052] FIGS. **22A-D** is a sample data collection questionnaire used for the healthy database.

[0053] **FIG. 23** is a flowchart showing processing performed by the computing device of **FIG. 24** when performing genotyping of sense strands and antisense strands from assay fragments.

[0054] **FIG. 24** is a block diagram showing a system provided herein;

[0055] **FIG. 25** is a flowchart of a method of identifying a biological sample provided herein;

[0056] **FIG. 26** is a graphical representation of data from a mass spectrometer;

[0057] **FIG. 27** is a diagram of wavelet transformation of mass spectrometry data;

[0058] **FIG. 28** is a graphical representation of wavelet stage 0 hi data;

[0059] **FIG. 29** is a graphical representation of stage 0 noise profile;

[0060] **FIG. 30** is a graphical representation of generating stage noise standard deviations;

[0061] **FIG. 31** is a graphical representation of applying a threshold to data stages;

[0062] **FIG. 32** is a graphical representation of a sparse data set;

[0063] **FIG. 33** is a formula for signal shifting;

[0064] **FIG. 34** is a graphical representation of a wavelet transformation of a denoised and shifted signal;

[0065] **FIG. 35** is a graphical representation of a denoised and shifted signal;

[0066] **FIG. 36** is a graphical representation of removing peak sections;

[0067] **FIG. 37** is a graphical representation of generating a peak free signal;

[0068] **FIG. 38** is a block diagram of a method of generating a baseline correction;

[0069] **FIG. 39** is a graphical representation of a baseline and signal;

[0070] **FIG. 40** is a graphical representation of a signal with baseline removed;

[0071] **FIG. 41** is a table showing compressed data;

[0072] **FIG. 42** is a flowchart of method for compressing data;

[0073] **FIG. 43** is a graphical representation of mass shifting;

[0074] **FIG. 44** is a graphical representation of determining peak width;

[0075] **FIG. 45** is a graphical representation of removing peaks;

[0076] **FIG. 46** is a graphical representation of a signal with peaks removed;

[0077] **FIG. 47** is a graphical representation of a residual baseline;

[0078] **FIG. 48** is a graphical representation of a signal with residual baseline removed;

[0079] **FIG. 49** is a graphical representation of determining peak height;

[0080] **FIG. 50** is a graphical representation of determining signal-to-noise for each peak;

[0081] **FIG. 51** is a graphical representation of determining a residual error for each peak;

[0082] **FIG. 52** is a graphical representation of peak probabilities;

[0083] **FIG. 53** is a graphical representation of applying an allelic ratio to peak probability;

[0084] **FIG. 54** is a graphical representation of determining peak probability;

[0085] **FIG. 55** is a graphical representation of calling a genotype;

[0086] **FIG. 56** is a flowchart showing a statistical procedure for calling a genotype;

[0087] **FIG. 57** is a flowchart showing processing performed by the computing device of **FIG. 1** when performing standardless genotyping; and

[0088] **FIG. 58** is graphical representation of applying an allelic ratio to peak probability for standardless genotype processing.

DETAILED DESCRIPTION

[0089] Definitions

[0090] Unless defined otherwise, all technical and scientific terms used herein have the same meaning as is commonly understood by one of ordinary skill in the art to which this invention belongs. All patents, applications, published applications and other publications and sequences from GenBank and other databases referred to herein throughout the disclosure are incorporated by reference in their entirety.

[0091] As used herein, a biopolymer includes, but is not limited to, nucleic acid, proteins, polysaccharides, lipids and other macromolecules. Nucleic acids include DNA, RNA, and fragments thereof. Nucleic acids can be derived from genomic DNA, RNA, mitochondrial nucleic acid, chloroplast nucleic acid and other organelles with separate genetic material.

[0092] As used herein, morbidity refers to conditions, such as diseases or disorders, that compromise the health and well-being of an organism, such as an animal. Morbidity susceptibility or morbidity-associated genes are genes that, when altered, for example, by a variation in nucleotide sequence, facilitate the expression of a specific disease clinical phenotype. Thus, morbidity susceptibility genes have the potential, upon alteration, of increasing the likelihood or general risk that an organism will develop a specific disease.

[0093] As used herein, mortality refers to the statistical likelihood that an organism, particularly an animal, will not survive a full predicted lifespan. Hence, a trait or a marker, such as a polymorphism, associated with increased mortality is observed at a lower frequency in older than younger segments of a population.

[0094] As used herein, a polymorphism, e.g. genetic variation, refers to a variation in the sequence of a gene in the genome amongst a population, such as allelic variations and other variations that arise or are observed. Thus, a polymorphism refers to the occurrence of two or more genetically determined alternative sequences or alleles in a population. These differences can occur in coding and non-coding portions of the genome, and can be manifested or detected as differences in nucleic acid sequences, gene expression, including, for example transcription, processing, translation, transport, protein processing, trafficking, DNA synthesis, expressed proteins, other gene products or products of biochemical pathways or in post-translational modifications and any other differences manifested amongst members of a population. A single nucleotide polymorphism (SNP) refers to a polymorphism that arises as the result of a single base change, such as an insertion, deletion or change in a base.

[0095] A polymorphic marker or site is the locus at which divergence occurs. Such site can be as small as one base pair (an SNP). Polymorphic markers include, but are not limited to, restriction fragment length polymorphisms, variable number of tandem repeats (VNTR's), hypervariable regions, minisatellites, dinucleotide repeats, trinucleotide repeats, tetranucleotide repeats and other repeating patterns, simple sequence repeats and insertional elements, such as Alu. Polymorphic forms also are manifested as different mendelian alleles for a gene. Polymorphisms can be observed by differences in proteins, protein modifications, RNA expression modification, DNA and RNA methylation, regulatory

factors that alter gene expression and DNA replication, and any other manifestation of alterations in genomic nucleic acid or organelle nucleic acids.

[0096] As used herein, a healthy population refers to a population of organisms, including but are not limited to, animals, bacteria, viruses, parasites, plants, eubacteria, and others, that are disease free. The concept of disease-free is a function of the selected organism. For example, for mammals it refers to a subject not manifesting any disease state. Practically a healthy subject, when human, is defined as human donor who passes blood bank criteria to donate blood for eventual use in the general population. These criteria are as follows: free of detectable viral, bacterial, mycoplasma, and parasitic infections; not anemic; and then further selected based upon a questionnaire regarding history (see **FIG. 3**). Thus, a healthy population represents an unbiased population of sufficient health to donate blood according to blood bank criteria, and not further selected for any disease state. Typically such individuals are not taking any medications. For plants, for example, it is a plant population that does not manifest diseases pathology associated with plants. For bacteria it is a bacterial population replicating without environmental stress, such as selective agents, heat and other pathogens.

[0097] As used herein, a healthy database (or healthy patient database) refers to a database of profiles of subjects that have not been pre-selected for any particular disease. Hence, the subjects that serve as the source of data for the database are selected, according to predetermined criteria, to be healthy. In contrast to other such databases that have been pre-selected for subjects with a particular disease or other characteristic, the subjects for the database provided herein are not so-selected. Also, if the subjects do manifest a disease or other condition, any polymorphism discovered or characterized should be related to an independent disease or condition. In a one embodiment, where the subjects are human, a healthy subject manifests no disease symptoms and meets criteria, such as those set by blood banks for blood donors.

[0098] Thus, the subjects for the database are a population of any organism, including, but are not limited to, animals, plants, bacteria, viruses, parasites and any other organism or entity that has nucleic acid. Among subjects are mammals, such as, although not necessarily, humans. Such a database can capture the diversity of a population, thus providing for discovery of rare polymorphisms.

[0099] As used herein, a profile refers to information relating to, but not limited to and not necessarily including all of, age, sex, ethnicity, disease history, family history, phenotypic characteristics, such as height and weight and other relevant parameters. A sample collect information form is shown in **FIG. 22**, which illustrates profile intent.

[0100] As used herein, a disease state is a condition or abnormality or disorder that can be inherited or result from environmental stresses, such as toxins, bacterial, fungal and viral infections.

[0101] As used herein, set of non-selected subjects means that the subjects have not been pre-selected to share a common disease or other characteristic. They can be selected to be healthy as defined herein.

[0102] As used herein, a phenotype refers to a set of parameters that includes any distinguishable trait of an organism. A phenotype can be physical traits and can be, in instances in which the subject is an animal, a mental trait, such as emotional traits. Some phenotypes can be determined by observation elicited by questionnaires (see, e.g., **FIGS. 3 and 22**) or by referring to prior medical and other records. For purposes herein, a phenotype is a parameter around which the database can be sorted.

[0103] As used herein, a parameter is any input data that will serve as a basis for sorting the database. These parameters will include phenotypic traits, medical histories, family histories and any other such information elicited from a subject or observed about the subject. A parameter can describe the subject, some historical or current environmental or social influence experienced by the subject, or a condition or environmental influence on someone related to the subject. Paramaters include, but are not limited to, any of those described herein, and known to those of skill in the art.

[0104] As used herein, haplotype refers to two or polymorphism located on a single DNA strand. Hence, haplotyping refers to identification of two or more polymorphisms on a single DNA strand. Haplotypes can be indicative of a phenotype. For some disorders a single polymorphism can suffice to indicate a trait; for others a plurality (i.e., a haplotype) can be needed. Haplotyping can be performed by isolating nucleic acid and separating the strands. In addition, when using enzymes such a certain nucleases, that produce, different size fragments from each strand, strand separation is not needed for haplotyping.

[0105] As used herein, pattern with reference to a mass spectrum or mass spectrometric analyses, refers to a characteristic distribution and number of signals (such peaks or digital representations thereof).

[0106] As used herein, signal in the context of a mass spectrum and analysis thereof refers to the output data, which the number or relative number of moleucles having a particular mass. Signals include "peaks" and digital representations thereof.

[0107] As used herein, adaptor, when used with reference to haplotyping using Fen ligase, refers to a nucleic acid that specifically hybridizes to a polymorphism of interest. An adaptor can be partially double-stranded. An adaptor complex is formed when an adaptor hybridizes to its target.

[0108] As used herein, a target nucleic acid refers to any nucleic acid of interest in a sample. It can contain one or more nucleotides.

[0109] As used herein, standardless analysis refers to a determination based upon an internal standard. For example, the frequency of a polymorphism can be determined herein by comparing signals within a single mass spectrum.

[0110] As used herein, amplifying refers to methods for increasing the amount of a bipolymer, especially nucleic acids. Based on the 5' and 3' primers that are chosen, amplication also serves to restrict and define the region of the genome which is subject to analysis. Amplification can be performed by any method known to those skilled in the art, including use of the polymerase chain reaction (PCR) etc. Amplification, e.g., PCR must be done quantitatively when the frequency of polymorphism is required to be determined.

[0111] As used herein, cleaving refers to non-specific and specific fragmentation of a biopolymer.

[0112] As used herein, multiplexing refers to the simultaneous detection of more than one polymorphism. Methods for performing multiplexed reactions, particularly in conjunction with mass spectrometry are known (see, e.g., U.S. Pat. Nos. 6,043,031, 5,547,835 and International PCT application No. WO 97/37041).

[0113] As used herein, reference to mass spectrometry encompasss any suitable mass spectrometric format known to those of skill in the art. Such formats inlude, but are not limited to, Matrix-Assisted Laser Desorption/Ionization, Time-of-Flight (MALDI-TOF), Electrospray (ES), IR-MALDI (see, e.g., published International PCT application No.99/57318 and U.S. Pat. No. 5,118,937), Ion Cyclotron Resonance (ICR), Fourier Transform and combinations thereof. MALDI, particular UV and IR, are among the formats contemplated.

[0114] As used herein, mass spectrum refers to the presentation of data obtained from analyzing a biopolymer or fragment thereof by mass spectrometry either graphically or encoded numerically.

[0115] As used herein, a blood component is a component that is separated from blood and includes, but is not limited to red blood cells and platelets, blood clotting factors, plasma, enzymes, plasminogen, immunoglobulins. A cellular blood component is a component of blood, such as a red blood cell, that is a cell. A blood protein is a protein that is normally found in blood. Examples of such proteins are blood factors VII and VIII. Such proteins and components are well-known to those of skill in the art.

[0116] As used herein, plasma can be prepared by any method known to those of skill in the art. For example, it can be prepared by centrifuging blood at a force that pellets the red cells and forms an interface between the red cells and the buffy coat, which contains leukocytes, above which is the plasma. For example, typical platelet concentrates contain at least about 10% plasma.

[0117] Blood can be separated into its components, including, but not limited to, plasma, platelets and red blood cells by any method known to those of skill in the art. For example, blood can be centrifuged for a sufficient time and at a sufficient acceleration to form a pellet containing the red blood cells. Leukocytes collect primarily at the interface of the pellet and supernatant in the buffy coat region. The supernatant, which contains plasma, platelets, and other blood components, can then be removed and centrifuged at a higher acceleration, whereby the platelets pellet.

[0118] As used herein, p53 is a cell cycle control protein that assesses DNA damage and acts as a transcription factor regulation gene which control cell growth, DNA repair and apoptosis. The p53 mutations have been found in a wide variety of different cancers, including all of the different types of leukemia, with varying frequency. The loss of normal p53 functions results in genomic instability and uncontrolled growth of the host cell.

[0119] As used herein, p21 is a cyclin-dependent kinase inhibitor, associated with G1 phase arrest of normal cells. Expression triggers apoptosis or programmed cell death and has been associated with Wilms' tumor, a pediatric kidney cancer.

[0120] As used herein, Factor VII is a serine protease involved the extrinsic blood coagulation cascade. This factor is activated by thrombin and works with tissue factor (Factor III) in the processing of Factor X to Factor Xa. Evidence has supported an association between polymorphisms in the gene and increase Factor VII activity which can result in an elevated risk of ischemic cardiovascular disease including myocardial infarction.

[0121] As used herein, a relational database stores information in a form representative of matrices, such as two-dimensional tables, including rows and columns of data, or higher dimensional matrices. For example, in one embodiment, the relational database has separate tables each with a parameter. The tables are linked with a record number, which also acts as an index. The database can be searched or sorted by using data in the tables and is stored in any suitable storage medium, such as floppy disk, CD rom disk, hard drive or other suitable medium.

[0122] As used herein, a bar codes refers any array of optically readable marks of any desired size and shape that are arranged in a reference context or frame of, typically, although not necessarily, one or more columns and one or more rows. For purposes herein, the bar code refers to any symbology, not necessary "bar" but can include dots, characters or any symbol or symbols.

[0123] As used herein, symbology refers to an identifier code or symbol, such as a bar code, that is linked to a sample. The index will reference each such symbology. The symbology is any code known or designed by the user. The symbols are associated with information stored in the database. For example, each sample can be uniquely identified with an encoded symbology. The parameters, such as the answers to the questions and subsequent genotypic and other information obtained upon analysis of the samples is included in the database and associated with the symbology. The database is stored on any suitable recording medium, such as a hard drive, a floppy disk, a tape, a CD ROM, a DVD disk and any other suitable medium.

[0124] DATABASES

[0125] Human genotyping is currently dependent on collaborations with hospitals, tissues banks and research institutions that provide samples of disease tissue. This approach is based on the concept that the onset and/or progression of diseases can be correlated with the presence of a polymorphisms or other genetic markers. This approach does not consider that disease correlated with the presence of specific markers and the absence of specific markers. It is shown herein that identification and scoring of the appearance and disappearance of markers is possible only if these markers are measured in the background of healthy subjects where the onset of disease does not mask the change in polymorphism occurrence. Databases of information from disease populations suffer from small sample size, selection bias and heterogeneity. The databases provided herein from healthy populations solve these problems by permitting large sample bands, simple selection methods and diluted heterogeneity.

[0126] Provided herein are first databases of parameters, associated with non-selected, particularly healthy, subjects. Also provided are combinations of the databases with indexed samples obtained from each of the subjects. Further provided are databases produced from the first databases.

These contain, in addition to the original parameters, information, such as genotypic information, including, but are not limited to, genomic sequence information, derived from the samples.

[0127] The databases, which are herein designated healthy databases, are so-designated because they are not obtained from subjects pre-selected for a particular disease. Hence, although individual members can have a disease, the collection of individuals is not selected to have a particular disease.

[0128] The subjects from whom the parameters are obtained comprise either a set of subjects who are randomly selected across, typically, all populations, or are pre-selected to be disease-free or healthy. As a result, the database is not selected to be representative of any pre-selected phenotype, genotype, disease or other characteristic. Typically the number of subjects from which the database is prepared is selected to produce statistically significant results when used in the methods provided herein. Generally, the number of subjects will be greater than 100, 200, and typically than 1000. The precise number can be empirically determined based upon the frequency of the parameter(s) that can be used to sort the database. Generally the population can have at least 50, at least 100, at least 200, at least 500, at least 1000, at least 5000 or at least 10,000 or more subjects.

[0129] Upon identification of a collection of subjects, information about each subject is recorded and associated with each subject as a database. The information associated with each of the subjects, includes, but is not limited to, information related to historical characteristics of the subjects, phenotypic characteristics and also genotypic characteristics, medical characteristics and any other traits and characteristics about the subject that can be determined. This information will serve as the basis for sorting the database.

[0130] In an exemplary embodiment, the subjects are mammals, such as humans, and the information relates to one or more of parameters, such as age, sex, medical history, ethnicity and any other factor. Such information, when the animals are humans, for example, can be obtained by a questionnaire and by observations about the individual, such as hair color, eye color and other characteristics. Genotypic information can be obtained from tissue or other body and body fluid samples from the subject.

[0131] The healthy genomic database can include profiles and polymorphisms from healthy individuals from a library of blood samples where each sample in the library is an individual and separate blood or other tissue sample. Each sample in the database is profiled as to the sex, age, ethnic group, and disease history of the donor.

[0132] The databases are generated by first identifying healthy populations of subjects and obtaining information about each subject that will serve as the sorting parameters for the database. This information can be entered into a storage medium, such as the memory of a computer.

[0133] The information obtained about each subject in a population used for generating the database is stored in a computer memory or other suitable storage medium. The information is linked to an identifier associated with each subject. Hence the database will identify a subject, for example by a datapoint representative of a bar code, and then all information, such as the information from a questionnaire, regarding the individual is associated with the datapoint. As the information is collected the database is generated.

[0134] Thus, for example, profile information, such as subject histories obtained from questionnaires, is collected in the database. The resulting database can be sorted as desired, using standard software, such as by age, sex and/or ethnicity. An exemplary questionnaire for subjects from whom samples are to be obtained is shown in FIGS. **22A-D**. Each questionnaire, for example, can be identified by a bar code, particularly a machine readable bar code for entry into the database. After a subject provides data and is deemed to be healthy (i.e., meets standards for blood donation), the data in the questionnaire is entered into the database and is associated with the bar code. A tissue, cell or blood sample is obtained from the subject.

[0135] **FIG. 4** exemplifies processing and tracking of blood sample components. Each component is tracked with a bar code, dated, is entered into the database and associated with the subject and the profile of the subject. Typically, the whole blood is centrifuged to produce plasma, red blood cells (which pellet) and leukocytes found in the buffy coat which layers in between. Various samples are obtained and coded with a bar code and stored for use as needed.

[0136] Samples are collected from the subjects. The samples include, but are not limited to, tissues, cells, and fluids, such as nucleic acid, blood, plasma, amniotic fluid, synovial fluid, urine, saliva, aqueous humor, sweat, sperm samples and cerebral spinal fluid. It is understood that the particular set of samples depends upon the organisms in the population.

[0137] Once samples are obtained the collection can be stored and, in some embodiments, each sample is indexed with an identifier, particularly a machine readable code, such as a bar code. For analyses, the samples or components of the samples, particularly biopolymers and small molecules, such as nucleic acids and/or proteins and metabolites, are isolated.

[0138] After samples are analyzed, this information is entered into the database in the memory of the storage medium and associated with each subject. This information includes, but is not limited to, genotypic information. Particularly, nucleic acid sequence information and other information indicative of polymorphisms, such as masses of PCR fragments, peptide fragment sequences or masses, spectra of biopolymers and small molecules and other indicia of the structure or function of a gene, gene product or other marker from which the existence of a polymorphism within the population can be inferred.

[0139] In an exemplary embodiment, a database can be derived from a collection of blood samples. For example, **FIG. 1** (see, also **FIG. 10**) shows the status of a collection of over 5000 individual samples. The samples were processed in the laboratory following SOP (standard operating procedure) guidelines. Any standard blood processing protocol can be used.

[0140] For the exemplary database described herein, the following criteria were used to select subjects:

[0141] No testing is done for infectious agents.

[0142] Age: At least 17 years old

[0143] Weight: Minimum of 110 pounds

[0144] Permanently Disqualified:

[0145] History of hepatitis (after age 11)

[0146] Leukemia Lymphoma

[0147] Human immunodeficiency virus (HIV),AIDS

[0148] Chronic kidney disease

[0149] Temporarily Disqualified:

[0150] Pregnancy—until six weeks after delivery, miscarriage or abortion

[0151] Major surgery or transfusions—for one year

[0152] Mononucleosis—until complete recovery

[0153] Prior whole blood donation—for eight weeks

[0154] Antibiotics by injection for one week; by mouth, for forty-eight hours, except antibiotics for skin complexion;

[0155] 5 year Deferment:

[0156] Internal cancer and skin cancer if it has been removed, is healed and there is no recurrence

[0157] These correspond to blood bank criteria for donating blood and represent a healthy population as defined herein for a human healthy database.

[0158] Structure of the Database

[0159] Any suitable database structure and format known to those of skill in the art can be employed. For example, a relational database is a an exemplary format in which data are stored as matrices or tables of the parameters linked by an indexer that identifies each subject. Software for preparing and manipulating, including sorting the database, can be readily developed or adapted from commercially available software, such as Microsoft Access.

[0160] Quality Control

[0161] Quality control procedures can be implemented. For example, after collection of samples, the quality of the collection in the bank can be assessed. For example, mix-up of samples can be checked by testing for known markers, such as sex. After samples are separated by ethnicity, samples are randomly tested for a marker associated with a particular ethnicity, such as HLA DQA1 group specific component, to assess whether the samples have been properly sorted by ethnic group. An exemplary sample bank is depicted in **FIG. 4**.

[0162] Obtaining Genotypic Data and Other Parameters for the Database

[0163] After informational and historical parameters are entered into the database, material from samples obtained from each subject, is analyzed. Analyzed material include proteins, metabolites, nucleic acids, lipids and any other desired constituent of the material. For example, nucleic acids, such as genomic DNA, can be analyzed by sequencing.

[0164] Sequencing can be performed using any method known to those of skill in the art. For example, if a polymorphism is identified or known, and it is desired to assess its frequency or presence among the subjects in the database, the region of interest from each sample can be isolated, such as by PCR or restriction fragments, hybridization or other suitable method known to those of skill in the art and sequenced. For purposes herein, sequencing analysis can be effected using mass spectrometry (see, e.g., U.S. Pat. Nos. 5,547,835, 5,622,824, 5,851,765, and 5,928,906). Nucleic acids also can be sequenced by hybridization (see, e.g., U.S. Pat. Nos. 5,503,980, 5,631,134, 5,795,714) and including analysis by mass spectrometry (see, U.S. application Ser. Nos. 08/419,994 and 09/395,409).

[0165] In other detection methods, it is necessary to first amplify prior to identifying the allelic variant. Amplification can be performed, e.g., by PCR and/or LCR, according to methods known in the art. In one embodiment, genomic DNA of a cell is exposed to two PCR primers and amplification for a number of cycles sufficient to produce the required amount of amplified DNA. In some embodiments, the primers are located between 150 and 350 base pairs apart.

[0166] Alternative amplification methods include: self sustained sequence replication (Guatelli, J. C. et al., 1990, Proc. Natl. Acad. Sci. U.S.A. 87:1874-1878), transcriptional amplification system (Kwoh, D. Y. et al., 1989, Proc. Natl. Acad. Sci. U.S.A. 86:1173-1177), Q-Beta Replicase (Lizardi, P. M. et al., 1988, Bio/Technology 6:1197), or any other nucleic acid amplification method, followed by the detection of the amplified molecules using techniques well known to those of skill in the art. These detection schemes are especially useful for the detection of nucleic acid molecules if such molecules are present in very low numbers.

[0167] Nucleic acids also can be analyzed by detection methods and protocols, particularly those that rely on mass spectrometry (see, e.g., U.S. Pat. No. 5,605,798, 6,043,031, allowed copending U.S. application Ser. No. 08/744,481, U.S. application Ser. No. 08/990,851 and International PCT application No. WO 99/31278, International PCT application No. WO 98/2001 9). These methods can be automated (see, e.g., copending U.S. application Ser. No. 09/285,481 and published International PCT application No. PCT/US00/08111, which describes an automated process line). Among the methods of analysis herein are those involving the primer oligo base extension (PROBE) reaction with mass spectrometry for detection (described herein and elsewhere, see e.g., U.S. Pat. No. 6,043,031; see, also U.S. application Ser. Nos. 09/287,681, 09/287,682, 09/287,141 and 09/287,679, allowed copending U.S. application Ser. No. 08/744,481, International PCT application No. PCT/US97/20444, published as International PCT application No. WO 98/20019, and based upon U.S. application Ser. Nos. 08/744,481, 08/744,590, 08/746,036, 08/746,055, 08/786,988, 08/787,639, 08/933,792, 08/746,055, 08/786,988 and 08/787,639; see, also U.S. application Ser. No. 09/074,936, U.S. Pat. No. 6,024,925, and U.S. application Ser. Nos. 08/746,055 and 08/786,988, and published International PCT application No. WO 98/20020)

[0168] A chip based format in which the biopolymer is linked to a solid support, such as a silicon or silicon-coated substrate, such as in the form of an array, is among the formats for performing the analyses is. Generally, when analyses are performed using mass spectrometry, particularly MALDI, small nanoliter volumes of sample are loaded on, such that the resulting spot is about, or smaller than, the

size of the laser spot. It has been found that when this is achieved, the results from the mass spectrometric analysis are quantitative. The area under the signals in the resulting mass spectra are proportional to concentration (when normalized and corrected for background). Methods for preparing and using such chips are described in U.S. Pat. No. 6,024,925, co-pending U.S. application Ser. Nos. 08/786,988, 09/364,774, 09/371,150 and 09/297,575; see, also U.S. application Ser. No. PCT/US97/20195, which published as WO 98/20020. Chips and kits for performing these analyses are commercially available from SEQUENOM under the trademark MassARRAY. MassArray relies on the fidelity of the enzymatic primer extension reactions combined with the miniaturized array and MALDI-TOF (Matrix-Assisted Laser Desorption Ionization-Time of Flight) mass spectrometry to deliver results rapidly. It accurately distinguishes single base changes in the size of DNA fragments associated with genetic variants without tags.

[0169] The methods provided herein permit quantitative determination of alleles. The areas under the signals in the mass spectra can be used for quantitative determinations. The frequency is determined from the ratio of the signal to the total area of all of the spectrum and corrected for background. This is possible because of the PROBE technology as described in the above applications incorporated by reference herein.

[0170] Additional methods of analyzing nucleic acids include amplification-based methods including polymerase chain reaction (PCR), ligase chain reaction (LCR), mini-PCR, rolling circle amplification, autocatalytic methods, such as those using Qβ replicase, TAS, 3SR, and any other suitable method known to those of skill in the art.

[0171] Other methods for analysis and identification and detection of polymorphisms, include but are not limited to, allele specific probes, Southern analyses, and other such analyses.

[0172] The methods described below provide ways to fragment given amplified or non-amplified nucleotide sequences thereby producing a set of mass signals when mass spectrometry is used to analyze the fragment mixtures.

[0173] Amplified fragments are yielded by standard polymerase chain methods (U.S. Pat. Nos. 4,683,195 and 4,683,202). The fragmentation method involves the use of enzymes that cleave single or double strands of DNA and enzymes that ligate DNA. The cleavage enzymes can be glycosylases, nickases, and site-specific and non site-specific nucleases, such as, but are not limited to, glycosylases, nickases and site-specific nucleases.

[0174] Glycosylase Fragmentation Method

[0175] DNA glycosylases specifically remove a certain type of nucleobase from a given DNA fragment. These enzymes can thereby produce abasic sites, which can be recognized either by another cleavage enzyme, cleaving the exposed phosphate backbone specifically at the abasic site and producing a set of nucleobase specific fragments indicative of the sequence, or by chemical means, such as alkaline solutions and or heat. The use of one combination of a DNA glycosylase and its targeted nucleotide would be sufficient to generate a base specific signature pattern of any given target region.

[0176] Numerous DNA glcosylases are known, For example, a DNA glycosylase can be uracil-DNA glycolsylase (UDG), 3-methyladenine DNA glycosylase, 3-methyladenine DNA glycosylase II, pyrimidine hydrate-DNA glycosylase, FaPy-DNA glycosylase, thymine mismatch-DNA glycosylase, hypoxanthine-DNA glycosylase, 5-Hydroxymethyluracil DNA glycosylase (HmUDG), 5-Hydroxymethylcytosine DNA glycosylase, or 1,N6-etheno-adenine DNA glycosylase (see, e.g.,, U.S. Pat. Nos. 5,536,649, 5,888,795, 5,952,176 and 6,099,553, International PCT application Nos. WO 97/03210, WO 99/54501; see, also, Eftedal et al. (1993) Nucleic Acids Res 21:2095-2101, Bjelland and Seeberg (1987) Nucleic Acids Res. 15:2787-2801, Saparbaev et al. (1995) Nucleic Acids Res. 23:3750-3755, Bessho (1999) Nucleic Acids Res. 27:979-983) corresponding to the enzyme's modified nucleotide or nucleotide analog target. uracil-DNA glycolsylase (UDG) is an exemplary glycosylase.

[0177] Uracil, for example, can be incorporated into an amplified DNA molecule by amplifying the DNA in the presence of normal DNA precursor nucleotides (e.g. dCTP, dATP, and dGTP) and dUTP. When the amplified product is treated with UDG, uracil residues are cleaved. Subsequent chemical treatment of the products from the UDG reaction results in the cleavage of the phosphate backbone and the generation of nucleobase specific fragments. Moreover, the separation of the complementary strands of the amplified product prior to glycosylase treatment allows complementary patterns of fragmentation to be generated. Thus, the use of dUTP and Uracil DNA glycosylase allows the generation of T specific fragments for the complementary strands, thus providing information on the T as well as the A positions within a given sequence. Similar to this, a C-specific reaction on both (complementary) strands (i.e. with a C-specific glycosylase) yields information on C as well as G positions within a given sequence if the fragmentation patterns of both amplification strands are analyzed separately. Thus, with the glycosylase method and mass spectrometry, a full series of A, C, G and T specific fragmentation patterns can be analyzed.

[0178] Nickase Fragmentation Method

[0179] A DNA nickase, or DNase, can be used to recognize and cleave one strand of a DNA duplex. Numerous nickases are known. Among these, for example, are nickase NY2A nickase and NYS1 nickase (Megabase) with the following cleavage sites:

[0180] NY2A:

[0181] 5' . . . R AG . . . 3'

[0182] 3' . . . Y TC . . . 5' where R=A or G and Y=C or T

[0183] NYS1:

[0184] 5' . . . CC[A/G/T] . . . 3'

[0185] 3' . . . GG[T/C/A] . . . 5'.

[0186] Fen-Ligase Fragmentation Method

[0187] The Fen-ligase method involves two enzymes: Fen-1 enzyme and a ligase. The Fen-1 enzyme is a site-specific nuclease known as a "flap" endonuclease (U.S. Pat. Nos. 5,843,669, 5,874,283, and 6,090,606). This enzyme recognizes and cleaves DNA "flaps" created by the overlap

of two oligonucleotides hybridized to a target DNA strand. This cleavage is highly specific and can recognize single base pair mutations, permitting detection of a single homologue from an individual heterozygous at one SNP of interest and then genotyping that homologue at other SNPs occurring within the fragment. Fen-1 enzymes can be Fen-1 like nucleases e.g. human, murine, and Xenopus XPG enzymes and yeast RAD2 nucleases or Fen-1 endonucleases from, for example, *M. jannaschii, P. furiosus,* and *P. woesei.* Among such enzymes are the Fen-1 enzymes.

[0188] The ligase enzyme forms a phosphodiester bond between two double stranded nucleic acid fragments. The ligase can be DNA Ligase I or DNA Ligase III (see, e.g., U.S. Pat. Nos. U.S. 5,506,137, 5,700,672, 5,858,705 and 5,976,806; see, also, Waga, et al. (1994) J. Biol. Chem. 269:10923-10934, Li et al. (1994) Nucleic Acids Res. 22:632-638, Arrand et al. (1986) J. Biol. Chem. 261:9079-9082, Lehman (1974) Science 186:790-797, Higgins and Cozzarelli (1979) Methods Enzymol. 68:50-71, Lasko et al. (1990) Mutation Res. 236:277-287, and Lindahl and Barnes (1992) Ann. Rev. Biochem. 61:251-281). Thermostable ligase (Epicenter Technologies), where "thermostable" denotes that the ligase retains activity even after exposure to temperatures necessary to separate two strands of DNA, are among the ligases for use herein.

[0189] Type IIS Enzyme Fragmentation Method

[0190] Restriction enzymes bind specifically to and cleave double-stranded DNA at specific sites within or adjacent to a particular recognition sequence. These enzymes have been classified into three groups (e.g. Types I, II, and III) as known to those of skill in the art. Because of the properties of type I and type III enzymes, they have not been widely used in molecular biological applications. Thus, for purposes herein type II enzymes are among those contemplated. Of the thousands of restriction enzymes known in the art, there are 179 different type II specificities. Of the 179 unique type II restriction endonucleases, 31 have a 4-base recognition sequence, 11 have a 5-base recognition sequence, 127 have a 6-base recognition sequence, and 10 have recognition sequences of greater than six bases (U.S. Pat. No. 5,604,098). Of category type II enzymes, type IIS is exemplified herein.

[0191] Type IIS enzymes can be Alw XI, Bbv I, Bce 83, Bpm I, Bsg I, Bsm AI, Bsm FI, Bsa I, Bcc I, Bcg I, Ear I, Eco 57I, Esp 3I, Fau I, Fok I, Gsu I, Hga I, Mme I, Mbo II, Sap I, and the otheres.

[0192] The Fok I enzyme endonuclease is an exemplary well characterized member of the Type IIS class (see, e.g., U.S. Pat. Nos. 5,714,330, 5,604,098, 5,436,150, 6,054,276 and 5,871,911; see, also, Szybalski et al. (1991) Gene 100:13-26, Wilson and Murray (1991) Ann. Rev. Genet. 25:585-627, Sugisaki et al. (1981) Gene 16:73-78, Podhajska and Szalski (1985) Gene 40:175-182. Fok I recognizes the sequence 5'GGATG-3' and cleaves DNA accordingly. Type IIS restriction sites can be introduced into DNA targets by incorporating the sites into primers used to amplify such targets. Fragments produced by digestion with Fok I are site specific and can be analyzed by mass spectrometry methods such as MALDI-TOF mass spectrometry, ESI-TOF mass spectrometry, and any other type of mass spectrometry well known to those of skill in the art.

[0193] Once a polymorphism has been found to correlate with a parameter such as age, age groups can be screened for polymorphisms. The possibility of false results due to allelic dropout is examined by doing comparative PCR in an adjacent region of the genome.

[0194] Analyses

[0195] In using the database, allelic frequencies can be determined across the population by analyzing each sample in the population individually, determining the presence or absence of allele or marker of interest in each individual sample, and then determining the frequency of the marker in the population. The database can then be sorted (stratified) to identify any correlations between the allele and a selected parameter using standard statistical analysis. If a correlation is observed, such as a decrease in a particular marker with age or correlation with sex or other parameter, then the marker is a candidate for further study, such as genetic mapping to identify a gene or pathway in which it is involved. The marker can then be correlated, for example, with a disease. Haplotying also can be carried out. Genetic mapping can be effected using standard methods and can also require use of databases of others, such as databases previously determined to be associated with a disorder.

[0196] Exemplary analyses have been performed and these are shown in the figures, and discussed herein.

[0197] Sample Pooling

[0198] It has been found that using the databases provided herein, or any other database of such information, substantially the same frequencies that were obtained by examining each sample separately can be obtained by pooling samples, such as in batches of 10, 20, 50, 100, 200, 500, 1000 or any other number. A precise number can be determined empirically if necessary, and can be as low as 3.

[0199] In one embodiment, the frequency of genotypic and other markers can be obtained by pooling samples. To do this a target population and a genetic variation to be assessed is selected, a plurality of samples of biopolymers are obtained from members of the population, and the biopolymer from which the marker or genotype can be inferred is determined or detected. A comparison of samples tested in pools and individually and the sorted results therefrom are shown in **FIG. 9**, which shows frequency of the factor VII Allele 353Q. **FIG. 10** depicts the frequency of the CETP Allele in pooled versus individual samples. **FIG. 15** shows ethnic diversity among various ethnic groups in the database using pooled DNA samples to obtain the data. FIGS. **12-14** show mass spectra for these samples.

[0200] Pooling of test samples has application not only to the healthy databases provided herein, but also to use in gathering data for entry into any database of subjects and genotypic information, including typical databases derived from diseased populations. What is demonstrated herein, is the finding that the results achieved are statistically the same as the results that would be achieved if each sample is analyzed separately. Analysis of pooled samples by a method, such as the mass spectrometric methods provided herein, permits resolution of such data and quantitation of the results.

[0201] For factor VII the R53Q acid polymorphism was assessed. In **FIG. 9**, the "individual" data represent allelic frequency observed in 92 individuals reactions. The pooled data represent the allelic frequency of the same 92 individu-

als pooled into a single probe reaction. The concentration of DNA in the samples of individual donors is 250 nanograms. The total concentration of DNA in the pooled samples is also 250 nanograms, where the concentration of any individual DNA is 2.7 nanograms.

[0202] It also was shown that it is possible to reduce the DNA concentration of individuals in a pooled samples from 2.7 nanograms to 0.27 nanograms without any change in the quality of the spectrum or the ability to quantitate the amount of sample detected. Hence low concentrations of sample can be used in the pooling methods.

[0203] Use of the Databases and Markers Identified Thereby

[0204] The successful use of genomics requires a scientific hypothesis (i.e., common genetic variation, such as a SNP), a study design (i.e., complex disorders), samples and technology, such as the chip-based mass spectrometric analyses (see, e.g., U.S. Pat. No. 5,605,798, U.S. Pat. No. 5,777,324, U.S. Pat. No. 6,043,031, allowed copending U.S. application Ser. No. 08/744,481, U.S. application Ser. No. 08/990,851, International PCT application No. WO 98/20019, copending U.S. application Ser. No. 09/285,481, which describes an automated process line for analyses; see, also, U.S. application Ser. Nos. 08/617,256, 09/287,681, 09/287,682, 09/287,141 and 09/287,679, allowed copending U.S. application Ser. No. 08/744,481, International PCT application No. PCT/US97/20444, published as International PCT application No. WO 98/20019, and based upon U.S. application Ser. Nos. 08/744,481, 08/744,590, 08/746,036, 08/746,055, 08/786,988, 08/787,639, 08/933,792, 08/746, 055, 09/266,409, 08/786,988 and 08/787,639; see, also U.S. application Ser. No. 09/074,936). All of these aspects can be used in conjunction with the databases provided herein and samples in the collection.

[0205] The databases and markers identified thereby can be used, for example, for identification of previously unidentified or unknown genetic markers and to identify new uses for known markers. As markers are identified, these can be entered into the database to use as sorting parameters from which additional correlations can be determined.

[0206] Previously Unidentified or Unknown Genetic Markers

[0207] The samples in the healthy databases can be used to identify new polymorphisms and genetic markers, using any mapping, sequencing, amplification and other methodologies, and in looking for polymorphisms among the population in the database. The thus-identified polymorphism can then be entered into the database for each sample, and the database sorted (stratified) using that polymorphism as a sorting parameter to identify any patterns and correlations that emerge, such as age correlated changes in the frequency of the identified marker. If a correlation is identified, the locus of the marker can be mapped and its function or effect assessed or deduced.

[0208] Thus, the databases here provide means for:

[0209] identification of significantly different allelic frequencies of genetic factors by comparing the occurrence or disappearance of the markers with increasing age in population and then associating the markers with a disease or a biochemical pathway;

[0210] identification of significantly different allelic frequencies of disease causing genetic factors by comparing the male with the female population or comparing other selected stratified populations and associating the markers with a disease or a biochemical pathway;

[0211] identification of significantly different allelic frequencies of disease causing genetic factors by comparing different ethnic groups and associating the markers with a disease or a biochemical pathway that is known to occur in high frequency in the ethnic group;

[0212] profiling potentially functional variants of genes through the general panmixed population stratified according to age, sex, and ethnic origin and thereby demonstrating the contribution of the variant genes to the physical condition of the investigated population;

[0213] identification of functionally relevant gene variants by gene disequilibrium analysis performed within the general panmixed population stratified according to age, sex, and ethnic origin and thereby demonstrating their contribution to the physical condition of investigated population;

[0214] identification of potentially functional variants of chromosomes or parts of chromosomes by linkage disequilibrium analysis performed within the general panmixed population stratified according to age, sex, and ethnic origin and thereby demonstrating their contribution to the physical condition of investigated population.

[0215] Uses of the Identified Markers and Known Markers

[0216] The databases can also be used in conjunction with known markers and sorted to identify any correlations. For example, the databases can be used for:

[0217] determination and evaluation of the penetrance of medically relevant polymorphic markers;

[0218] determination and evaluation of the diagnostic specificity of medically relevant genetic factors;

[0219] determination and evaluation of the positive predictive value of medically relevant genetic factors;

[0220] determination and evaluation of the onset of complex diseases, such as, but are not limited to, diabetes, hypertension, autoimmune diseases, arteriosclerosis, cancer and other diseases within the general population with respect to their causative genetic factors;

[0221] delineation of the appropriate strategies for preventive disease treatment;

[0222] delineation of appropriate timelines for primary disease intervention;

[0223] validation of medically relevant genetic factors identified in isolated populations regarding their general applicability;

[0224] validation of disease pathways including all potential target structures identified in isolated populations regarding their general applicability; and

[0225] validation of appropriate drug targets identified in isolated populations regarding their general applicability.

[0226] Among the diseases and disorders for which polymorphisms can be linked include, those linked to inborn errors of metabolism, acquired metabolic disorders, intermediary metabolism, oncogenesis pathways, blood clotting pathways, and DNA synthetic and repair pathways, DNA repair/replication/transcription factors and activities, e.g., such as genes related to oncogenesis, aging and genes involved in blood clotting and the related biochemical pathways that are related to thrombosis, embolism, stroke, myocardial infarction, angiogenesis and oncogenesis.

[0227] For example, a number of diseases are caused by or involve deficient or defective enzymes in intermediary metabolism (see, e.g., Tables 1 and 2, below) that result, upon ingestion of the enzyme substrates, in accumulation of harmful metabolites that damage organs and tissues, particularly an infant's developing brain and other organs, resulting in mental retardation and other developmental disorders.

[0228] Identification of Markers and Genes for such Disorders is of Great Interest.

[0229] Model Systems

[0230] Several gene systems, p21, p53 and Lipoprotein Lipase polymorphism (N291S), were selected. The p53 gene is a tumor suppressor gene that is mutated in diverse tumor types. One common allelic variant occurs at codon 72. A polymorphism that has been identified in the p53 gene, i.e., the R72P allele, results in an amino acid exchange, arginine to proline, at codon 72 of the gene.

[0231] Using diseased populations, it has been shown that there are ethnic differences in the allelic distribution of these alleles among African-Americans and Caucasians in the U.S. The results here support this finding and also demonstrate that the results obtained with a healthy database are meaningful (see, **FIG. 7B**).

[0232] The 291S allele leads to reduced levels of high density lipoprotein cholesterol (HDL-C) that is associated with an increased risk of males for arteriosclerosis and in particular myocardial infarction (see, Reymer et al. (1995) *Nature Genetics* 10:28-34).

[0233] Both genetic polymorphisms were profiled within a part of the Caucasian population-based sample bank. For the polymorphism located in the lipoprotein lipase gene a total of 1025 unselected individuals (436 males and 589 females) were tested. Genomic DNA was isolated from blood samples obtained from the individuals.

[0234] As shown in the Examples and figures, an exemplary database containing about 5000 subjects, answers to the questionnaire (see **FIG. 3**), and genotypic information has been stratified. A particular known allele has been selected, and the samples tested for the marker using mass spectrometric analyses, particularly PROBE (see the EXAMPLES) to identify polymorphisms in each sample. The population in the database has been sorted according to various parameters and correlations have been observed. For example, FIGS. **2**A-C, show sorting of the data by age and sex for the Lipoprotein Lipase gene in the Caucasian population in the database. The results show a decrease in the frequency of the allele with age in males but no such decrease in females. Other alleles that have been tested against the database, include, alleles of p53, p21 and factor VII. Results when sorted by age are shown in the figures.

[0235] These examples demonstrate an effect of altered frequency of disease causing genetic factors within the general population. The scientific interpretation of those results allows prediction of medical relevance of polymorphic genetic alterations. In addition, conclusions can be drawn with regard to their penetrance, diagnostic specificity, positive predictive value, onset of disease, most appropriate onset of preventive strategies, and the general applicability of genetic alterations identified in isolated populations to panmixed populations.

[0236] Therefore, an age- and sex-stratified population-based sample bank that is ethnically homogenous is a suitable tool for rapid identification and validation of genetic factors regarding their potential medical utility.

[0237] Exemplary Computer System for Creating, Storing and Processing the Databases

[0238] Systems

[0239] Systems, including computers, containing the databases are provided herein. The computers and databases can be used in conjunction, for example, with the APL system (see, copending U.S. application Ser. No. 09/285,481), which is an automated system for analyzing biopolymers, particularly nucleic acids. Results from the APL system can be entered into the database.

[0240] Any suitable computer system can be used. The computer system can be integrated into systems for sample analysis, such as the automated process line described herein (see, e.g., copending U.S. application Ser. No. 09/285,481).

[0241] **FIG. 17** is a block diagram of a computer constructed to provide and process the databases described herein. The processing that maintains the database and performs the methods and procedures can be performed on multiple computers all having a similar construction, or can be performed by a single, integrated computer. For example, the computer through which data are added to the database can be separate from the computer through which the database is sorted, or can be integrated with it. In either arrangement, the computers performing the processing can have a construction as illustrated in **FIG. 17**.

[0242] **FIG. 17** is a block diagram of an exemplary computer **1700** that maintains the database described above and performs the methods and procedures. Each computer **1700** operates under control of a central processor unit (CPU) **1702**, such as a "Pentium" microprocessor and associated integrated circuit chips, available from Intel Corporation of Santa Clara, Calif., USA. A computer user can input commands and data from a keyboard and display mouse **1704** and can view inputs and computer output at a display **1706**. The display is typically a video monitor or flat panel display device. The computer **1700** also includes a direct access storage device (DASD) **1707**, such as a fixed hard disk drive. The memory **1708** typically comprises volatile semiconductor random access memory (RAM). Each computer can include a program product reader **1710** that accepts a program product storage device **1712**, from which the program product reader can read data (and to

which it can optionally write data). The program product reader can comprise, for example, a disk drive, and the program product storage device can comprise removable storage media such as a magnetic floppy disk, an optical CD-ROM disc, a CD-R disc, a CD-RW disc, or a DVD data disc. If desired, the computers can be connected so they can communicate with each other, and with other connected computers, over a network **1713**. Each computer **1700** can communicate with the other connected computers over the network **1713** through a network interface **1714** that enables communication over a connection **1716** between the network and the computer.

[0243] The computer **1700** operates under control of programming steps that are temporarily stored in the memory **1708** in accordance with conventional computer construction. When the programming steps are executed by the CPU **1702**, the pertinent system components perform their respective functions. Thus, the programming steps implement the functionality of the system as described above. The programming steps can be received from the DASD **1707**, through the program product reader **1712**, or through the network connection **1716**. The storage drive **1710** can receive a program product, read programming steps recorded thereon and transfer the programming steps into the memory **1708** for execution by the CPU **1702**. As noted above, the program product storage device **1710** can comprise any one of multiple removable media having recorded computer-readable instructions, including magnetic floppy disks and CD-ROM storage discs. Other suitable program product storage devices can include magnetic tape and semiconductor memory chips. In this way, the processing steps necessary for operation can be embodied on a program product.

[0244] Alternatively, the program steps can be received into the operating memory **1708** over the network **1713**. In the network method, the computer receives data including program steps into the memory **1708** through the network interface **1714** after network communication has been established over the network connection **1716** by well-known methods that will be understood by those skilled in the art without further explanation. The program steps are then executed by the CPU **1702** to implement the processing of the Garment Database system.

[0245] It should be understood that all of the computers of the system and can have a construction similar to that shown in **FIG. 17**. Details described with respect to the **FIG. 17** computer **1700** will be understood to apply to all computers of the system **1700**. This is indicated by multiple computers **1700** shown connected to the network **1713**. Any one of the computers **1700** can have an alternative construction, so long as they can communicate with the other computers and support the functionality described herein.

[0246] **FIG. 18** is a flow diagram that illustrates the processing steps performed using the computer illustrated in **FIG. 17**, to maintain and provide access to the databases, such as for identifying polymorphic genetic markers. In particular, the information contained in the database is stored in computers having a construction similar to that illustrated in **FIG. 17**. The first step for maintaining the database, as indicated in **FIG. 18**, is to identify healthy members of a population. As noted above, the population members are subjects that are selected only on the basis of being healthy, and where the subjects are mammals, such as humans, they can be selected based upon apparent health and the absence of detectable infections. The step of identifying is represented by the flow diagram box numbered **1802**.

[0247] The next step, represented by the flow diagram box numbered **1804**, is to obtain identifying and historical information and data relating to the identified members of the population. The information and data comprise parameters for each of the population members, such as member age, ethnicity, sex, medical history, and ultimately genotypic information. Initially, the parameter information is obtained from a questionnaire answered by each member, from whom a body tissue or body fluid sample also is obtained. The step of entering and storing these parameters into the database of the computer is represented by the flow diagram box numbered **1806**. As additional information about each population member and corresponding sample is obtained, this information can be inputted into the database and can serve as a sorting parameter.

[0248] In the next step, represented by the flow diagram box numbered **1808**, the parameters of the members are associated with an indexer. This step can be executed as part of the database storage operation, such as when a new data record is stored according to the relational database structure and is automatically linked with other records according to that structure. The step **1806** also can be executed as part of a conventional data sorting or retrieval process, in which the database entries are searched according to an input search or indexing key value to determine attributes of the data. For example, such search and sort techniques can be used to follow the occurrence of known genetic markers and then determine if there is a correlation with diseases for which they have been implicated. Examples of this use are for assessing the frequencies of the p53 and Lipoprotein Lipase polymorphisms.

[0249] Such searching of the database also can be valuable for identifying one or more genetic markers whose frequency changes within the population as a function of age, ethnic group, sex, or some other criteria. This can allow the identification of previously unknown polymorphisms and, ultimately, identification of a gene or pathway involved in the onset and progression of disease.

[0250] In addition, the database can be used for taking an identified polymorphism and ascertaining whether it changes in frequency when the data are sorted according to a selected parameter.

[0251] In this way, the databases and methods provided herein permit, among other things, identification of components, particularly key components, of a disease process by understanding its genetic underpinnings, and also an understanding of processes, such as individual drug responses. The databases and methods provided herein also can be used in methods involving elucidation of pathological pathways, in developing new diagnostic assays, identifying new potential drug targets, and in identifying new drug candidates.

[0252] Morbidity and/or Early Mortality Associated Polymorphisms

[0253] A database containing information provided by a population of healthy blood donors who were not selected for any particular disease to can be used to identify poly-

morphisms and the alleles in which they are present, whose frequency decreases with age. These can represent morbidity susceptibility markers and genes.

[0254] Polymorphisms of the genome can lead to altered gene function, protein function or genome instability. To identify those polymorphisms which have a clinical relevance/utility is the goal of a world-wide scientific effort. It can be expected that the discovery of such polymorphisms will have a fundamental impact on the identification and development of novel drug compounds to cure diseases. The strategy to identify valuable polymorphisms is cumbersome and dependent upon the availability of many large patient and control cohorts to show disease association. In particular, genes that cause a general risk of the population to suffer from any disease (morbidity susceptibility genes) will escape these case/control studies entirely.

[0255] Here described is a screening strategy to identify morbidity susceptibility genes underlying a variety of different diseases. The definition of a morbidity susceptibility gene is a gene that is expressed in many different cell types or tissues (housekeeping gene) and its altered function can facilitate the expression of a clinical phenotype caused by disease-specific susceptibility genes that are involved in a pathway specific for this disorder. In other words, these morbidity susceptibility genes predispose people to develop a distinct disease according to their genetic make-up for this disease.

[0256] Candidates for morbidity susceptibility genes can be found at the bottom level of pathways involving transcription, translation, heat-shock proteins, protein trafficking, DNA repair, assembly systems for subcellular structures (e.g. mitochondria, peroxysomes and other cellular microbodies), receptor signaling cascades, immunology, etc. Those pathways control the quality of life at the cellular level as well as for the entire organism. Mutations/polymorphisms located in genes encoding proteins for those pathways can reduce the fitness of cells and make the organism more susceptible to express the clinical phenotype caused by the action of a disease-specific susceptibility gene. Therefore, these morbidity susceptibility genes can be potentially involved in a whole variety of different complex diseases if not in all. Disease-specific susceptibility genes are involved in pathways that can be considered as disease-specific pathways like glucose-, lipid, hormone metabolism, etc.

[0257] The exemplified method permit, among other things, identification of genes and/or gene products involved in a man's general susceptibility to morbidity and/or mortality; use of these genes and/or gene products in studies to elucidate the genetic underpinnings of human diseases; use of these genes and/or gene products in combinatorial statistical analyses without or together with disease-specific susceptibility genes; use of these genes and/or gene products to predict penetrance of disease susceptibility genes; use of these genes and/or gene products in predisposition and/or acute medical diagnostics and use of these genes and/or gene products to develop drugs to cure diseases and/or to extend the life span of humans.

[0258] SCREENING PROCESS

[0259] The healthy population stratified by age, gender and ethnicity, etc. is a very efficient and a universal screening tool for morbidity associated genes. Changes of allelic frequencies in the young compared to the old population are expected to indicate putative morbidity susceptibility genes. Individual samples of this healthy population base can be pooled to further increase the throughput. In an experiment, pools of young and old Caucasian females and males were applied to screen more than 400 randomly chosen single nucleotide polymorphisms located in many different genes. Candidate polymorphisms were identified if the allelic difference was greater than 8% between young and old for both or only one of the genders. The initial results were assayed again in at least one independent subsequent experiments. Repeated experiments are necessary to recognize unstable biochemical reactions, which occur with a frequency of about 2-3% and can mimic age-related allelic frequency differences. Average frequency differences and standard deviations are calculated after successful reproducibility of initial results. The final allelic frequency is then compared to a reference population of Caucasian CEPH sample pool. The result should show similar allelic frequencies in the young Caucasian population. Subsequently, the exact allele frequencies of candidates including genotype information were obtained by analyzing all individual samples. This procedure is straight forward with regard to time and cost. It enables the screening of an enormous number of SNPs. So far, several markers with a highly significant association to age were identified and described below.

[0260] In general at least 5 individuals in a stratified population should to be screened to produce statistically significant results. The frequency of the allele is determined for an age stratified population. Chi square analysis is then performed on the allelic frequencies to determine if the difference between age groups is statistically significant. A p value less than of 0.1 is considered to represent a statistically significant difference. Typically the p value should be less than 0.05.

[0261] Clinical Trials

[0262] The identification of markers whose frequency in a population decreases with age also allows for better designed and balanced clinical trials. Currently, if a clinical trial utilizes a marker as a significant endpoint in a study and the marker disappears with age, then the results of the study can be inaccurate. By using methods provided herein, it can be ascertained that if a marker decreases in frequency with age. This information can be considered and controlled when designing the study. For, example, an age independent marker could be substituted in its place.

[0263] The following examples are included for illustrative purposes only and are not intended to limit the scope of the invention.

EXAMPLE 1

[0264] This example describes the use of a database containing information provided by a population of healthy blood donors who were not selected for any particular disease to determine the distribution of allelic frequencies of known genetic markers with age and by sex in a Caucasian subpopulation of the database. The results described in this example demonstrate that a disease-related genetic marker or polymorphism can be identified by sorting a healthy database by a parameter or parameters, such as age, sex and ethnicity.

[0265] Generating a Database

[0266] Blood was obtained by venous puncture from human subjects who met blood bank criteria for donating blood. The blood samples were preserved with EDTA at pH 8.0 and labeled. Each donor provided information such as age, sex, ethnicity, medical history and family medical history. Each sample was labeled with a barcode representing identifying information. A database was generated by entering, for each donor, the subject identifier and information corresponding to that subject into the memory of a computer storage medium using commercially available software, e.g., Microsoft Access.

[0267] Model Genetic Markers

[0268] The frequencies of polymorphisms known to be associated at some level with disease were determined in a subpopulation of the subjects represented in the database. These known polymporphisms occur in the p21, p53 and Lipoprotein Lipase genes. Specifically, the N291S polymorphism (N291S) of the Lipoprotein Lipase gene, which results in a substitution of a serine for an asparagine at amino acid codon 291, leads to reduced levels of high density lipoprotein cholesterol (HDL-C) that is associated with an increased risk of males for arteriosclerosis and in particular myocardial infarction (see, Reymer et al. (1995) *Nature Genetics* 10:28-34).

[0269] The p53 gene encodes a cell cycle control protein that assesses DNA damage and acts as a transcription factor regulating genes that control cell growth, DNA repair and apoptosis (programmed cell death). Mutations in the p53 gene have been found in a wide variety of different cancers, including different types of leukemia, with varying frequency. The loss of normal p53 function results in genomic instability an uncontrolled cell growth. A polymorphism that has been identified in the p53 gene, i.e., the R72P allele, results in the substitution of a proline for an arginine at amino acid codon 72 of the gene.

[0270] The p21 gene encodes a cyclin-dependent kinase inhibitor associated with G1 phase arrest of normal cells. Expression of the p21 gene triggers apoptosis. Polymorphisms of the p21 gene have been associated with Wilms' tumor, a pediatric kidney cancer. One polymorphism of the p21 gene, the S31R polymorphism, results in a substitution of an arginine for a serine at amino acid codon 31.

[0271] Database Analysis

Sorting of Subjects According to Specific Parameters

[0272] The genetic polymorphisms were profiled within segments of the Caucasian subpopulation of the sample bank. For p53 profiling, the genomic DNA isolated from blood from a total of 1277 Caucasian subjects age 18-59 years and 457 Caucasian subjects age 60-79 years was analyzed. For p21 profiling, the genomic DNA isolated from blood from a total of 910 Caucasian subjects age 18-49 years and 824 Caucasian subjects age 50-79 years was analyzed. For lipoprotein lipase gene profiling, the genomic DNA from a total of 1464 Caucasian females and 1470 Caucasian males under 60 years of age and a total of 478 Caucasian females and 560 Caucasian males over 60 years of age was analyzed.

Isolation and Analysis of Genomic DNA

[0273] Genomic DNA was isolated from blood samples obtained from the individuals. Ten milliliters of whole blood from each individual was centrifuged at 2000×g. One milliliter of the buffy coat was added to 9 ml of 155 mM NH_4Cl, 10 mM $KHCO_3$, and 0.1 mM Na_2EDTA, incubated 10 min at room temperature and centrifuged for 10 min at 2000×g. The supernatant was removed, and the white cell pellet was washed in 155 mM NH_4Cl, 10 mM $KHCO_3$ and 0.1 mM Na_2EDTA and resuspended in 4.5 ml of 50 mM Tris, 5 mM EDTA and 1% SDS. Proteins were precipitated from the cell lysate by 6 mM ammonium acetate, pH 7.3, and then separated from the nucleic acids by centrifugation at 3000× g. The nucleic acid was recovered from the supernatant by the addition of an equal volume of 100% isopropanol and centrifugation at 2000×g. The dried nucleic acid pellet was hydrated in 10 mM Tris, pH 7.6, and 1 mM Na_2EDTA and stored at 4° C.

[0274] Assays of the genomic DNA to determine the presence or absence of the known genetic markers were developed using the BiomassPROBE™ detection method (primer oligo base extension) reaction. This method uses a single detection primer followed by an oligonucleotide extension step to give products, which can be readily resolved by mass spectrometry, and, in particular, MALDI-TOF mass spectrometry. The products differ in length depending on the presence or absence of a polymorphism. In this method, a detection primer anneals adjacent to the site of a variable nucleotide or sequence of nucleotides, and the primer is extended using a DNA polymerase in the presence of one or more dideoxyNTPs and, optionally, one or more deoxyNTPs. The resulting products are resolved by MALDI-TOF mass spectrometry. The mass of the products as measured by MALDI-TOF mass spectrometry makes possible the determination of the nucleotide(s) present at the variable site.

[0275] First, each of the Caucasian genomic DNA samples was subjected to nucleic acid amplification using primers corresponding to sites 5' and 3' of the polymorphic sites of the p21 (S31R allele), p53 (R72P allele) and Lipoprotein Lipase (N291S allele) genes. One primer in each primer pair was biotinylated to permit immobilization of the amplification product to a solid support. Specifically, the polymerase chain reaction primers used for amplification of the relevant segments of the p21, p53 and lipoprotein lipase genes are shown below: US4p21c31-2F (SEQ ID NO: 9) and US5p21-2R (SEQ ID NO: 10) for p21 gene amplification; US4-p53-ex4-F (also shown as p53-ex4US4 (SEQ ID NO: 2)) and US5-p53/2-4R (also shown as US5P53/4R (SEQ ID NO: 3)) for p53 gene amplification; and US4-LPL-F2 (SEQ ID NO: 16) and US5-LPL-R2 (SEQ ID NO: 17) for lipoprotein lipase gene amplification.

[0276] Amplification of the respective DNA sequences was conducted according to standard protocols. For example, primers can be used in a concentration of 8 pmol. The reaction mixture (e.g., total volume 50 μl) can contain Taq-polymerase including 10×buffer and dTNPs. Cycling conditions for polymerase chain reaction amplification can typically be initially 5 min. at 95° C., followed by 1 min. at 94° C., 45 sec at 53° C., and 30 sec at 72° C. for 40 cycles with a final extension time of 5 min at 72° C. Amplification products can be purified by using Qiagen's PCR purification

kit (No. 28106) according to manufacturer's instructions. The elution of the purified products from the column can be done in 50 μl TE-buffer (10 mM Tris, 1 mM EDTA, pH 7.5).

[0277] The purified amplification products were immobilized via a biotin-avidin linkage to streptavidin-coated beads and the double-stranded DNA was denatured. A detection primer was then annealed to the immobilized DNA using conditions such as, for example, the following: 50 μl annealing buffer (20 mM Tris, 10 mM KCl, 10 mM $(NH_4)_2SO_4$, 2 mM $MgSO_2$, 1% Triton X-100, pH 8) at 50° C. for 10 min, followed by washing of the beads three times with 200 μl washing buffer (40 mM Tris, 1 mM EDTA, 50 mM NaCl, 0.1% Tween 20, pH 8.8) and once in 200 μl TE buffer.

[0278] The PROBE extension reaction was performed, for example, by, using some components of the DNA sequencing kit from USB (No. 70770) and dNTPs or ddNTPs from Pharmacia. An exemplary protocol could include a total reaction volume of 45 μl, containing of 21 μl water, 6 μl Sequenase-buffer, 3 μl 10 mM DTT solution, 4.5 μl, 0.5 mM of three dNTPs, 4.5 μl, 2 mM the missing one ddNTP, 5.5 μl glycerol enzyme dilution buffer, 0.25 μl Sequenase 2.0, and 0.25 pyrophosphatase. The reaction can then by pipetted on ice and incubated for 15 min at room temperature and for 5 min at 37° C. The beads can be washed three times with 200 μl washing buffer and once with 60 μl of a 70 mM NH_4-Citrate solution.

[0279] The DNA was denatured to release the extended primers from the immobilized template. Each of the resulting extension products was separately analyzed by MALDI-TOF mass spectrometry using 3-hydroxypicolinic acid (3-HPA) as matrix and a UV laser.

[0280] Specifically, the primers used in the PROBE reactions are as shown below: P21/31-3 (SEQ ID NO: 12) for PROBE analysis of the p21 polymorphic site; P53/72 (SEQ ID NO: 4) for PROBE analysis of the p53 polymorphic site; and LPL-2 for PROBE analysis of the lipoprotein lipase gene polymorphic site. In the PROBE analysis of the p21 polymorphic site, the extension reaction was performed using dideoxy-C. The products resulting from the reaction conducted on a "wild-type" allele template (wherein codon 31 encodes a serine) and from the reaction conducted on a polymorphic S31R allele template (wherein codon 31 encodes an arginine) are shown below and designated as P21/31-3 Ser (wt) (SEQ ID NO: 13) and P21/31-3 Arg (SEQ ID NO: 14), respectively. The masses for each product as can be measured by MALDI-TOF mass spectrometry are also provided (i.e., 4900.2 Da for the wild-type product and 5213.4 Da for the polymorphic product).

[0281] In the PROBE analysis of the p53 polymorphic site, the extension reaction was performed using dideoxy-C. The products resulting from the reaction conducted on a "wild-type" allele template (wherein codon 72 encodes an arginine) and from the reaction conducted on a polymorphic R72P allele template (wherein codon 72 encodes a proline) are shown below and designated as Cod72 G Arg (wt) and Cod72 C Pro, respectively. The masses for each product as can be measured by MALDI-TOF mass spectrometry are also provided (i.e., 5734.8 Da for the wild-type product and 5405.6 Da for the polymorphic product).

[0282] In the PROBE analysis of the lipoprotein lipase gene polymorphic site, the extension reaction was performed using a mixture of ddA and ddT. The products resulting from the reaction conducted on a "wild-type" allele template (wherein codon 291 encodes an asparagine) and from the reaction conducted on a polymorphic N291S allele template (wherein codon 291 encodes a serine) are shown below and designated as 291Asn and 291Ser, respectively. The masses for each product as can be measured by MALDI-TOF mass spectrometry are also provided (i.e., 6438.2 Da for the wild-type product and 6758.4 Da for the polymorphic product).

P53-1 (R72P)
PCR Product length: 407 bp

US4-p53-ex4-F (SEQ ID NO: 1)
ctg aggacctggt cctctgactg

ctcttttcac cgatctacagtccccttgccgtcccaagc aat
ggatgatttgatgctgt

ccccggacga tattgaacaa tggttcactg aagacccagg tccagatgaa gctc-
ccagaa
P53/72 **72R**
tgccagaggctgctcccccgc gtggcccctg caccagcagc tcctacaccg gcggc-
ccctg

c 72P
caccagcccc ctcctggccc ctgtcatctt ctgtcccttc ccagaaaacc tac-
cagggca

gctacggttt ccgtctgggc ttcttgcatt ctgggacagc caagtctgtg acttg-
cacgg

tcagttgccc tgaggggctg **gcttccatga gacttcaa**
US5-p53/2-4R

[0283]

Primers (SEQ ID NOs: 2–4)	
p53-ex4FUS4	cccagtcacgacgttgtaaaacgc tga gga cct ggt cct ctg ac
US5P53/4R	agcggataacaatttcacacaggt tga agt ctc atg gaa gcc
P53/72	gcc aga ggc tgc tcc cc

[0284]

	Masses			
Allele	Product Termination: ddC	SEQ #	Length	Mass
P53/72	gccagaggctgctcccc	5	17	5132.4
Cod72 G Arg (wt)	gccagaggctgctccccgc	6	19	5734.8
Cod72 C Pro	gccagaggctgctccccc	7	18	5405.6

[0285] Biotinylated US5 primer is used in the PCR amplification.

[0286] LPL-1 (N291S)

[0287] Amino acid exchange asparagine to serine at codon 291 of the lipoprotein lipase gene.

PCR Product length: 251 bp (SEQ ID NO: 15)

US4-LPL-F2 (SEQ ID NO: 16)

gcgctccatt catctcttca tcgactctct gttgaatgaa gaaaatccaa gtaag-
gccta

caggtgcagt tccaaggaag cctttgagaa agggctctgc ttgagttgta gaaa-
gaaccg

LPL-2 291N

ctgcaacaatctgggctatgagatcaataa agtcagagcc aaaagaagca gcaaaat-
gta

g 291S

cctgaagact cgttctcaga tgccc

US4-LPL-R2

[0288]

Primers (SEQ ID NOs: 16–18):	
US4-LPL-F2	cccagtcacgacgttgtaaaacgg cgc tcc att cat ctc ttc
US5-LPL-R2	agcggataacaatttcacacaggg ggc atc tga gaa cga gtc
LPL-2	caa tct ggg cta tga gat ca

SEQUENCE LISTING

<160> NUMBER OF SEQ ID NOS: 118

<210> SEQ ID NO 1
<211> LENGTH: 361
<212> TYPE: DNA
<213> ORGANISM: Homo Sapien

<400> SEQUENCE: 1

ctgaggacct ggtcctctga ctgctctttt cacccatcta cagtcccctt tgccgtccca 60

agcaatggat gatttgatgc tgtccccgga cgatattgaa caatggttca ctgaagaccc 120

aggtccagat gaagctccca gaatgccaga ggctgctccc cgcgtggccc ctgcaccagc 180

agctcctaca ccggcggccc ctgcaccagc cccctcctgg ccctgtcat cttctgtccc 240

ttcccagaaa acctaccagg gcagctacgg tttccgtctg ggcttcttgc attctgggac 300

agccaagtct gtgacttgca cggtcagttg ccctgagggg ctggcttcca tgagacttca 360

a 361

<210> SEQ ID NO 2
<211> LENGTH: 44
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 2

cccagtcacg acgttgtaaa acgctgagga cctggtcctc tgac 44

<210> SEQ ID NO 3
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 3

agcggataac aatttcacac aggttgaagt ctcatggaag cc 42

<210> SEQ ID NO 4
<211> LENGTH: 17
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 4

gccagaggct gctcccc 17

<210> SEQ ID NO 5
<211> LENGTH: 17
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 5

gccagaggct gctcccc 17

<210> SEQ ID NO 6

-continued

<211> LENGTH: 19
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 6

gccagaggct gctccccgc 19

<210> SEQ ID NO 7
<211> LENGTH: 18
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 7

gccagaggct gctccccc 18

<210> SEQ ID NO 8
<211> LENGTH: 161
<212> TYPE: DNA
<213> ORGANISM: Homo Sapien

<400> SEQUENCE: 8

gtccgtcaga acccatgcgg cagcaaggcc tgccgccgcc tcttcggccc agtggacagc 60

gagcagctga gccgcgactg tgatgcgcta atggcgggct gcatccagga ggcccgtgag 120

cgatggaact tcgactttgt caccgagaca ccactggagg g 161

<210> SEQ ID NO 9
<211> LENGTH: 43
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 9

cccagtcacg acgttgtaaa acggtccgtc agaacccatg cgg 43

<210> SEQ ID NO 10
<211> LENGTH: 44
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 10

agcggataac aatttcacac aggctccagt ggtgtctcgg tgac 44

<210> SEQ ID NO 11
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 11

cagcgagcag ctgag 15

<210> SEQ ID NO 12
<211> LENGTH: 15
<212> TYPE: DNA

-continued

<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 12

cagcgagcag ctgag 15

<210> SEQ ID NO 13
<211> LENGTH: 16
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 13

cagcgagcag ctgagc 16

<210> SEQ ID NO 14
<211> LENGTH: 17
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 14

cagcgagcag ctgagac 17

<210> SEQ ID NO 15
<211> LENGTH: 205
<212> TYPE: DNA
<213> ORGANISM: Homo Sapien

<400> SEQUENCE: 15

gcgctccatt catctcttca tcgactctct gttgaatgaa gaaaatccaa gtaaggccta 60

caggtgcagt tccaaggaag cctttgagaa agggctctgc ttgagttgta gaaagaaccg 120

ctgcaacaat ctgggctatg agatcaataa agtcagagcc aaaagaagca gcaaaatgta 180

cctgaagact cgttctcaga tgccc 205

<210> SEQ ID NO 16
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primers

<400> SEQUENCE: 16

cccagtcacg acgttgtaaa acggcgctcc attcatctct tc 42

<210> SEQ ID NO 17
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 17

agcggataac aatttcacac aggggcatc tgagaacgag tc 42

<210> SEQ ID NO 18
<211> LENGTH: 20
<212> TYPE: DNA

-continued

<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 18

caatctgggc tatgagatca 20

<210> SEQ ID NO 19
<211> LENGTH: 20
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 19

caatctgggc tatgagatca 20

<210> SEQ ID NO 20
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 20

caatctgggc tatgagatca a 21

<210> SEQ ID NO 21
<211> LENGTH: 22
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 21

caatctgggc tatgagatca gt 22

<210> SEQ ID NO 22
<211> LENGTH: 60
<212> TYPE: DNA
<213> ORGANISM: Homo Sapien
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 22

gtgccggcta ctcggatggc agcaaggact cctgcaaggg ggacagtgga ggcccacatg 60

<210> SEQ ID NO 23
<211> LENGTH: 60
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 23

ccacccacta ccggggcacg tggtacctga cgggcatcgt cagctggggc cagggctgcg 60

<210> SEQ ID NO 24
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 24

-continued

cccagtcacg acgttgtaaa acgatggcag caaggactcc tg 42

<210> SEQ ID NO 25
<211> LENGTH: 18
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 25

cacatgccac ccactacc 18

<210> SEQ ID NO 26
<211> LENGTH: 43
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 26

agcggataac aatttcacac aggtgacgat gcccgtcagg tac 43

<210> SEQ ID NO 27
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 27

atgccaccca ctacc 15

<210> SEQ ID NO 28
<211> LENGTH: 19
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 28

cacatgccac ccactaccg 19

<210> SEQ ID NO 29
<211> LENGTH: 20
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 29

cacatgccac ccactaccag 20

<210> SEQ ID NO 30
<211> LENGTH: 23
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Probe

<400> SEQUENCE: 30

agcggataac aatttcacac agg 23

<210> SEQ ID NO 31

-continued

<211> LENGTH: 2363
<212> TYPE: DNA
<213> ORGANISM: Homo Sapien
<220> FEATURE:
<221> NAME/KEY: CDS
<222> LOCATION: (138)...(2126)
<223> OTHER INFORMATION: AKAP-10
<300> PUBLICATION INFORMATION:
<308> DATABASE ACCESSION NUMBER: GenBank AF037439
<309> DATABASE ENTRY DATE: 1997-12-21

<400> SEQUENCE: 31

```
gcggcttgtt gataatatgg cggctggagc tgcctgggca tcccgaggag gcggtggggc     60

ccactcccgg aagaagggtc cttttcgcg ctagtgcagc ggcccctctg gacccggaag    120

tccgggccgg ttgctga atg agg gga gcc ggg ccc tcc ccg cgc cag tcc       170
                  Met Arg Gly Ala Gly Pro Ser Pro Arg Gln Ser
                   1               5                  10

ccc cgc acc ctc cgt ccc gac ccg ggc ccc gcc atg tcc ttc ttc cgg      218
Pro Arg Thr Leu Arg Pro Asp Pro Gly Pro Ala Met Ser Phe Phe Arg
            15                  20                  25

cgg aaa gtg aaa ggc aaa gaa caa gag aag acc tca gat gtg aag tcc      266
Arg Lys Val Lys Gly Lys Glu Gln Glu Lys Thr Ser Asp Val Lys Ser
         30                  35                  40

att aaa gct tca ata tcc gta cat tcc cca caa aaa agc act aaa aat      314
Ile Lys Ala Ser Ile Ser Val His Ser Pro Gln Lys Ser Thr Lys Asn
     45                  50                  55

cat gcc ttg ctg gag gct gca gga cca agt cat gtt gca atc aat gcc      362
His Ala Leu Leu Glu Ala Ala Gly Pro Ser His Val Ala Ile Asn Ala
 60                  65                  70                  75

att tct gcc aac atg gac tcc ttt tca agt agc agg aca gcc aca ctt      410
Ile Ser Ala Asn Met Asp Ser Phe Ser Ser Ser Arg Thr Ala Thr Leu
                 80                  85                  90

aag aag cag cca agc cac atg gag gct gct cat ttt ggt gac ctg ggc      458
Lys Lys Gln Pro Ser His Met Glu Ala Ala His Phe Gly Asp Leu Gly
            95                  100                 105

aga tct tgt ctg gac tac cag act caa gag acc aaa tca agc ctt tct      506
Arg Ser Cys Leu Asp Tyr Gln Thr Gln Glu Thr Lys Ser Ser Leu Ser
        110                 115                 120

aag acc ctt gaa caa gtc ttg cac gac act att gtc ctc cct tac ttc      554
Lys Thr Leu Glu Gln Val Leu His Asp Thr Ile Val Leu Pro Tyr Phe
    125                 130                 135

att caa ttc atg gaa ctt cgg cga atg gag cat ttg gtg aaa ttt tgg      602
Ile Gln Phe Met Glu Leu Arg Arg Met Glu His Leu Val Lys Phe Trp
140                 145                 150                 155

tta gag gct gaa agt ttt cat tca aca act tgg tcg cga ata aga gca      650
Leu Glu Ala Glu Ser Phe His Ser Thr Thr Trp Ser Arg Ile Arg Ala
                160                 165                 170

cac agt cta aac aca atg aag cag agc tca ctg gct gag cct gtc tct      698
His Ser Leu Asn Thr Met Lys Gln Ser Ser Leu Ala Glu Pro Val Ser
            175                 180                 185

cca tct aaa aag cat gaa act aca gcg tct ttt tta act gat tct ctt      746
Pro Ser Lys Lys His Glu Thr Thr Ala Ser Phe Leu Thr Asp Ser Leu
        190                 195                 200

gat aag aga ttg gag gat tct ggc tca gca cag ttg ttt atg act cat      794
Asp Lys Arg Leu Glu Asp Ser Gly Ser Ala Gln Leu Phe Met Thr His
    205                 210                 215

tca gaa gga att gac ctg aat aat aga act aac agc act cag aat cac      842
Ser Glu Gly Ile Asp Leu Asn Asn Arg Thr Asn Ser Thr Gln Asn His
220                 225                 230                 235
```

-continued

```
ttg ctg ctt tcc cag gaa tgt gac agt gcc cat tct ctc cgt ctt gaa      890
Leu Leu Leu Ser Gln Glu Cys Asp Ser Ala His Ser Leu Arg Leu Glu
                240                 245                 250

atg gcc aga gca gga act cac caa gtt tcc atg gaa acc caa gaa tct      938
Met Ala Arg Ala Gly Thr His Gln Val Ser Met Glu Thr Gln Glu Ser
            255                 260                 265

tcc tct aca ctt aca gta gcc agt aga aat agt ccc gct tct cca cta      986
Ser Ser Thr Leu Thr Val Ala Ser Arg Asn Ser Pro Ala Ser Pro Leu
        270                 275                 280

aaa gaa ttg tca gga aaa cta atg aaa agt ata gaa caa gat gca gtg     1034
Lys Glu Leu Ser Gly Lys Leu Met Lys Ser Ile Glu Gln Asp Ala Val
    285                 290                 295

aat act ttt acc aaa tat ata tct cca gat gct gct aaa cca ata cca     1082
Asn Thr Phe Thr Lys Tyr Ile Ser Pro Asp Ala Ala Lys Pro Ile Pro
300                 305                 310                 315

att aca gaa gca atg aga aat gac atc ata gca agg att tgt gga gaa     1130
Ile Thr Glu Ala Met Arg Asn Asp Ile Ile Ala Arg Ile Cys Gly Glu
                320                 325                 330

gat gga cag gtg gat ccc aac tgt ttc gtt ttg gca cag tcc ata gtc     1178
Asp Gly Gln Val Asp Pro Asn Cys Phe Val Leu Ala Gln Ser Ile Val
            335                 340                 345

ttt agt gca atg gag caa gag cac ttt agt gag ttt ctg cga agt cac     1226
Phe Ser Ala Met Glu Gln Glu His Phe Ser Glu Phe Leu Arg Ser His
        350                 355                 360

cat ttc tgt aaa tac cag att gaa gtg ctg acc agt gga act gtt tac     1274
His Phe Cys Lys Tyr Gln Ile Glu Val Leu Thr Ser Gly Thr Val Tyr
    365                 370                 375

ctg gct gac att ctc ttc tgt gag tca gcc ctc ttt tat ttc tct gag     1322
Leu Ala Asp Ile Leu Phe Cys Glu Ser Ala Leu Phe Tyr Phe Ser Glu
380                 385                 390                 395

tac atg gaa aaa gag gat gca gtg aat atc tta caa ttc tgg ttg gca     1370
Tyr Met Glu Lys Glu Asp Ala Val Asn Ile Leu Gln Phe Trp Leu Ala
                400                 405                 410

gca gat aac ttc cag tct cag ctt gct gcc aaa aag ggg caa tat gat     1418
Ala Asp Asn Phe Gln Ser Gln Leu Ala Ala Lys Lys Gly Gln Tyr Asp
            415                 420                 425

gga cag gag gca cag aat gat gcc atg att tta tat gac aag tac ttc     1466
Gly Gln Glu Ala Gln Asn Asp Ala Met Ile Leu Tyr Asp Lys Tyr Phe
        430                 435                 440

tcc ctc caa gcc aca cat cct ctt gga ttt gat gat gtt gta cga tta     1514
Ser Leu Gln Ala Thr His Pro Leu Gly Phe Asp Asp Val Val Arg Leu
    445                 450                 455

gaa att gaa tcc aat atc tgc agg gaa ggt ggg cca ctc ccc aac tgt     1562
Glu Ile Glu Ser Asn Ile Cys Arg Glu Gly Gly Pro Leu Pro Asn Cys
460                 465                 470                 475

ttc aca act cca tta cgt cag gcc tgg aca acc atg gag aag gtc ttt     1610
Phe Thr Thr Pro Leu Arg Gln Ala Trp Thr Thr Met Glu Lys Val Phe
                480                 485                 490

ttg cct ggc ttt ctg tcc agc aat ctt tat tat aaa tat ttg aat gat     1658
Leu Pro Gly Phe Leu Ser Ser Asn Leu Tyr Tyr Lys Tyr Leu Asn Asp
            495                 500                 505

ctc atc cat tcg gtt cga gga gat gaa ttt ctg ggc ggg aac gtg tcg     1706
Leu Ile His Ser Val Arg Gly Asp Glu Phe Leu Gly Gly Asn Val Ser
        510                 515                 520

ccg act gct cct ggc tct gtt ggc cct cct gat gag tct cac cca ggg     1754
Pro Thr Ala Pro Gly Ser Val Gly Pro Pro Asp Glu Ser His Pro Gly
    525                 530                 535
```

-continued

```
agt tct gac agc tct gcg tct cag tcc agt gtg aaa aaa gcc agt att     1802
Ser Ser Asp Ser Ser Ala Ser Gln Ser Ser Val Lys Lys Ala Ser Ile
540                 545                 550                 555

aaa ata ctg aaa aat ttt gat gaa gcg ata att gtg gat gcg gca agt     1850
Lys Ile Leu Lys Asn Phe Asp Glu Ala Ile Ile Val Asp Ala Ala Ser
                560                 565                 570

ctg gat cca gaa tct tta tat caa cgg aca tat gcc ggg aag atg aca     1898
Leu Asp Pro Glu Ser Leu Tyr Gln Arg Thr Tyr Ala Gly Lys Met Thr
            575                 580                 585

ttt gga aga gtg agt gac ttg ggg caa ttc atc cgg gaa tct gag cct     1946
Phe Gly Arg Val Ser Asp Leu Gly Gln Phe Ile Arg Glu Ser Glu Pro
        590                 595                 600

gaa cct gat gta agg aaa tca aaa gga tcc atg ttc tca caa gct atg     1994
Glu Pro Asp Val Arg Lys Ser Lys Gly Ser Met Phe Ser Gln Ala Met
    605                 610                 615

aag aaa tgg gtg caa gga aat act gat gag gcc cag gaa gag cta gct     2042
Lys Lys Trp Val Gln Gly Asn Thr Asp Glu Ala Gln Glu Glu Leu Ala
620                 625                 630                 635

tgg aag att gct aaa atg ata gtc agt gac att atg cag cag gct cag     2090
Trp Lys Ile Ala Lys Met Ile Val Ser Asp Ile Met Gln Gln Ala Gln
                640                 645                 650

tat gat caa ccg tta gag aaa tct aca aag tta tga ctcaaaactt          2136
Tyr Asp Gln Pro Leu Glu Lys Ser Thr Lys Leu  *
            655                 660

gagataaagg aaatctgctt gtgaaaaata agagaacttt tttcccttgg ttggattctt   2196

caacacagcc aatgaaaaca gcactatatt tctgatctgt cactgttgtt tccagggaga   2256

gaatggggag acaatcctag gacttccacc ctaatgcagt tacctgtagg gcataattgg   2316

atggcacatg atgtttcaca cagtgaggag tctttaaagg ttaccaa                 2363
```

<210> SEQ ID NO 32
<211> LENGTH: 662
<212> TYPE: PRT
<213> ORGANISM: Homo Sapien

<400> SEQUENCE: 32

```
Met Arg Gly Ala Gly Pro Ser Pro Arg Gln Ser Pro Arg Thr Leu Arg
 1               5                  10                  15

Pro Asp Pro Gly Pro Ala Met Ser Phe Phe Arg Arg Lys Val Lys Gly
            20                  25                  30

Lys Glu Gln Glu Lys Thr Ser Asp Val Lys Ser Ile Lys Ala Ser Ile
        35                  40                  45

Ser Val His Ser Pro Gln Lys Ser Thr Lys Asn His Ala Leu Leu Glu
    50                  55                  60

Ala Ala Gly Pro Ser His Val Ala Ile Asn Ala Ile Ser Ala Asn Met
65                  70                  75                  80

Asp Ser Phe Ser Ser Ser Arg Thr Ala Thr Leu Lys Lys Gln Pro Ser
                85                  90                  95

His Met Glu Ala Ala His Phe Gly Asp Leu Gly Arg Ser Cys Leu Asp
            100                 105                 110

Tyr Gln Thr Gln Glu Thr Lys Ser Ser Leu Ser Lys Thr Leu Glu Gln
        115                 120                 125

Val Leu His Asp Thr Ile Val Leu Pro Tyr Phe Ile Gln Phe Met Glu
    130                 135                 140
```

-continued

```
Leu Arg Arg Met Glu His Leu Val Lys Phe Trp Leu Glu Ala Glu Ser
145                 150                 155                 160

Phe His Ser Thr Thr Trp Ser Arg Ile Arg Ala His Ser Leu Asn Thr
                165                 170                 175

Met Lys Gln Ser Ser Leu Ala Glu Pro Val Ser Pro Ser Lys Lys His
            180                 185                 190

Glu Thr Thr Ala Ser Phe Leu Thr Asp Ser Leu Asp Lys Arg Leu Glu
        195                 200                 205

Asp Ser Gly Ser Ala Gln Leu Phe Met Thr His Ser Glu Gly Ile Asp
    210                 215                 220

Leu Asn Asn Arg Thr Asn Ser Thr Gln Asn His Leu Leu Leu Ser Gln
225                 230                 235                 240

Glu Cys Asp Ser Ala His Ser Leu Arg Leu Glu Met Ala Arg Ala Gly
                245                 250                 255

Thr His Gln Val Ser Met Glu Thr Gln Glu Ser Ser Ser Thr Leu Thr
            260                 265                 270

Val Ala Ser Arg Asn Ser Pro Ala Ser Pro Leu Lys Glu Leu Ser Gly
        275                 280                 285

Lys Leu Met Lys Ser Ile Glu Gln Asp Ala Val Asn Thr Phe Thr Lys
    290                 295                 300

Tyr Ile Ser Pro Asp Ala Ala Lys Pro Ile Pro Ile Thr Glu Ala Met
305                 310                 315                 320

Arg Asn Asp Ile Ile Ala Arg Ile Cys Gly Glu Asp Gly Gln Val Asp
                325                 330                 335

Pro Asn Cys Phe Val Leu Ala Gln Ser Ile Val Phe Ser Ala Met Glu
            340                 345                 350

Gln Glu His Phe Ser Glu Phe Leu Arg Ser His His Phe Cys Lys Tyr
        355                 360                 365

Gln Ile Glu Val Leu Thr Ser Gly Thr Val Tyr Leu Ala Asp Ile Leu
    370                 375                 380

Phe Cys Glu Ser Ala Leu Phe Tyr Phe Ser Glu Tyr Met Glu Lys Glu
385                 390                 395                 400

Asp Ala Val Asn Ile Leu Gln Phe Trp Leu Ala Ala Asp Asn Phe Gln
                405                 410                 415

Ser Gln Leu Ala Ala Lys Lys Gly Gln Tyr Asp Gly Gln Glu Ala Gln
            420                 425                 430

Asn Asp Ala Met Ile Leu Tyr Asp Lys Tyr Phe Ser Leu Gln Ala Thr
        435                 440                 445

His Pro Leu Gly Phe Asp Asp Val Val Arg Leu Glu Ile Glu Ser Asn
    450                 455                 460

Ile Cys Arg Glu Gly Gly Pro Leu Pro Asn Cys Phe Thr Thr Pro Leu
465                 470                 475                 480

Arg Gln Ala Trp Thr Thr Met Glu Lys Val Phe Leu Pro Gly Phe Leu
                485                 490                 495

Ser Ser Asn Leu Tyr Tyr Lys Tyr Leu Asn Asp Leu Ile His Ser Val
            500                 505                 510

Arg Gly Asp Glu Phe Leu Gly Gly Asn Val Ser Pro Thr Ala Pro Gly
        515                 520                 525

Ser Val Gly Pro Pro Asp Glu Ser His Pro Gly Ser Ser Asp Ser Ser
    530                 535                 540

Ala Ser Gln Ser Ser Val Lys Lys Ala Ser Ile Lys Ile Leu Lys Asn
```

-continued

```
545                 550                 555                 560

Phe Asp Glu Ala Ile Ile Val Asp Ala Ala Ser Leu Asp Pro Glu Ser
                565                 570                 575

Leu Tyr Gln Arg Thr Tyr Ala Gly Lys Met Thr Phe Gly Arg Val Ser
            580                 585                 590

Asp Leu Gly Gln Phe Ile Arg Glu Ser Glu Pro Glu Pro Asp Val Arg
        595                 600                 605

Lys Ser Lys Gly Ser Met Phe Ser Gln Ala Met Lys Lys Trp Val Gln
    610                 615                 620

Gly Asn Thr Asp Glu Ala Gln Glu Glu Leu Ala Trp Lys Ile Ala Lys
625                 630                 635                 640

Met Ile Val Ser Asp Ile Met Gln Gln Ala Gln Tyr Asp Gln Pro Leu
                645                 650                 655

Glu Lys Ser Thr Lys Leu
            660


<210> SEQ ID NO 33
<211> LENGTH: 2363
<212> TYPE: DNA
<213> ORGANISM: Homo Sapien
<220> FEATURE:
<221> NAME/KEY: CDS
<222> LOCATION: (138)...(2126)
<223> OTHER INFORMATION: AKAP-10-5
<220> FEATURE:
<221> NAME/KEY: allele
<222> LOCATION: 2073
<223> OTHER INFORMATION: Single Nucleotide Polymorphism: A to G

<400> SEQUENCE: 33

gcggcttgtt gataatatgg cggctggagc tgcctgggca tcccgaggag gcggtggggc     60

ccactcccgg aagaagggtc ccttttcgcg ctagtgcagc ggcccctctg gacccggaag    120

tccgggccgg ttgctga atg agg gga gcc ggg ccc tcc ccg cgc cag tcc       170
                  Met Arg Gly Ala Gly Pro Ser Pro Arg Gln Ser
                   1               5                  10

ccc cgc acc ctc cgt ccc gac ccg ggc ccc gcc atg tcc ttc ttc cgg      218
Pro Arg Thr Leu Arg Pro Asp Pro Gly Pro Ala Met Ser Phe Phe Arg
             15                  20                  25

cgg aaa gtg aaa ggc aaa gaa caa gag aag acc tca gat gtg aag tcc      266
Arg Lys Val Lys Gly Lys Glu Gln Glu Lys Thr Ser Asp Val Lys Ser
         30                  35                  40

att aaa gct tca ata tcc gta cat tcc cca caa aaa agc act aaa aat      314
Ile Lys Ala Ser Ile Ser Val His Ser Pro Gln Lys Ser Thr Lys Asn
     45                  50                  55

cat gcc ttg ctg gag gct gca gga cca agt cat gtt gca atc aat gcc      362
His Ala Leu Leu Glu Ala Ala Gly Pro Ser His Val Ala Ile Asn Ala
 60                  65                  70                  75

att tct gcc aac atg gac tcc ttt tca agt agc agg aca gcc aca ctt      410
Ile Ser Ala Asn Met Asp Ser Phe Ser Ser Ser Arg Thr Ala Thr Leu
                 80                  85                  90

aag aag cag cca agc cac atg gag gct gct cat ttt ggt gac ctg ggc      458
Lys Lys Gln Pro Ser His Met Glu Ala Ala His Phe Gly Asp Leu Gly
             95                  100                 105

aga tct tgt ctg gac tac cag act caa gag acc aaa tca agc ctt tct      506
Arg Ser Cys Leu Asp Tyr Gln Thr Gln Glu Thr Lys Ser Ser Leu Ser
        110                 115                 120

aag acc ctt gaa caa gtc ttg cac gac act att gtc ctc cct tac ttc      554
```

-continued

```
Lys Thr Leu Glu Gln Val Leu His Asp Thr Ile Val Leu Pro Tyr Phe
    125                 130                 135

att caa ttc atg gaa ctt cgg cga atg gag cat ttg gtg aaa ttt tgg      602
Ile Gln Phe Met Glu Leu Arg Arg Met Glu His Leu Val Lys Phe Trp
140                 145                 150                 155

tta gag gct gaa agt ttt cat tca aca act tgg tcg cga ata aga gca      650
Leu Glu Ala Glu Ser Phe His Ser Thr Thr Trp Ser Arg Ile Arg Ala
                160                 165                 170

cac agt cta aac aca atg aag cag agc tca ctg gct gag cct gtc tct      698
His Ser Leu Asn Thr Met Lys Gln Ser Ser Leu Ala Glu Pro Val Ser
            175                 180                 185

cca tct aaa aag cat gaa act aca gcg tct ttt tta act gat tct ctt      746
Pro Ser Lys Lys His Glu Thr Thr Ala Ser Phe Leu Thr Asp Ser Leu
        190                 195                 200

gat aag aga ttg gag gat tct ggc tca gca cag ttg ttt atg act cat      794
Asp Lys Arg Leu Glu Asp Ser Gly Ser Ala Gln Leu Phe Met Thr His
    205                 210                 215

tca gaa gga att gac ctg aat aat aga act aac agc act cag aat cac      842
Ser Glu Gly Ile Asp Leu Asn Asn Arg Thr Asn Ser Thr Gln Asn His
220                 225                 230                 235

ttg ctg ctt tcc cag gaa tgt gac agt gcc cat tct ctc cgt ctt gaa      890
Leu Leu Leu Ser Gln Glu Cys Asp Ser Ala His Ser Leu Arg Leu Glu
                240                 245                 250

atg gcc aga gca gga act cac caa gtt tcc atg gaa acc caa gaa tct      938
Met Ala Arg Ala Gly Thr His Gln Val Ser Met Glu Thr Gln Glu Ser
            255                 260                 265

tcc tct aca ctt aca gta gcc agt aga aat agt ccc gct tct cca cta      986
Ser Ser Thr Leu Thr Val Ala Ser Arg Asn Ser Pro Ala Ser Pro Leu
        270                 275                 280

aaa gaa ttg tca gga aaa cta atg aaa agt ata gaa caa gat gca gtg     1034
Lys Glu Leu Ser Gly Lys Leu Met Lys Ser Ile Glu Gln Asp Ala Val
    285                 290                 295

aat act ttt acc aaa tat ata tct cca gat gct gct aaa cca ata cca     1082
Asn Thr Phe Thr Lys Tyr Ile Ser Pro Asp Ala Ala Lys Pro Ile Pro
300                 305                 310                 315

att aca gaa gca atg aga aat gac atc ata gca agg att tgt gga gaa     1130
Ile Thr Glu Ala Met Arg Asn Asp Ile Ile Ala Arg Ile Cys Gly Glu
                320                 325                 330

gat gga cag gtg gat ccc aac tgt ttc gtt ttg gca cag tcc ata gtc     1178
Asp Gly Gln Val Asp Pro Asn Cys Phe Val Leu Ala Gln Ser Ile Val
            335                 340                 345

ttt agt gca atg gag caa gag cac ttt agt gag ttt ctg cga agt cac     1226
Phe Ser Ala Met Glu Gln Glu His Phe Ser Glu Phe Leu Arg Ser His
        350                 355                 360

cat ttc tgt aaa tac cag att gaa gtg ctg acc agt gga act gtt tac     1274
His Phe Cys Lys Tyr Gln Ile Glu Val Leu Thr Ser Gly Thr Val Tyr
    365                 370                 375

ctg gct gac att ctc ttc tgt gag tca gcc ctc ttt tat ttc tct gag     1322
Leu Ala Asp Ile Leu Phe Cys Glu Ser Ala Leu Phe Tyr Phe Ser Glu
380                 385                 390                 395

tac atg gaa aaa gag gat gca gtg aat atc tta caa ttc tgg ttg gca     1370
Tyr Met Glu Lys Glu Asp Ala Val Asn Ile Leu Gln Phe Trp Leu Ala
                400                 405                 410

gca gat aac ttc cag tct cag ctt gct gcc aaa aag ggg caa tat gat     1418
Ala Asp Asn Phe Gln Ser Gln Leu Ala Ala Lys Lys Gly Gln Tyr Asp
            415                 420                 425

gga cag gag gca cag aat gat gcc atg att tta tat gac aag tac ttc     1466
```

-continued

```
Gly Gln Glu Ala Gln Asn Asp Ala Met Ile Leu Tyr Asp Lys Tyr Phe
        430                 435                 440

tcc ctc caa gcc aca cat cct ctt gga ttt gat gat gtt gta cga tta     1514
Ser Leu Gln Ala Thr His Pro Leu Gly Phe Asp Asp Val Val Arg Leu
    445                 450                 455

gaa att gaa tcc aat atc tgc agg gaa ggt ggg cca ctc ccc aac tgt     1562
Glu Ile Glu Ser Asn Ile Cys Arg Glu Gly Gly Pro Leu Pro Asn Cys
460                 465                 470                 475

ttc aca act cca tta cgt cag gcc tgg aca acc atg gag aag gtc ttt     1610
Phe Thr Thr Pro Leu Arg Gln Ala Trp Thr Thr Met Glu Lys Val Phe
                480                 485                 490

ttg cct ggc ttt ctg tcc agc aat ctt tat tat aaa tat ttg aat gat     1658
Leu Pro Gly Phe Leu Ser Ser Asn Leu Tyr Tyr Lys Tyr Leu Asn Asp
            495                 500                 505

ctc atc cat tcg gtt cga gga gat gaa ttt ctg ggc ggg aac gtg tcg     1706
Leu Ile His Ser Val Arg Gly Asp Glu Phe Leu Gly Gly Asn Val Ser
        510                 515                 520

ccg act gct cct ggc tct gtt ggc cct cct gat gag tct cac cca ggg     1754
Pro Thr Ala Pro Gly Ser Val Gly Pro Pro Asp Glu Ser His Pro Gly
    525                 530                 535

agt tct gac agc tct gcg tct cag tcc agt gtg aaa aaa gcc agt att     1802
Ser Ser Asp Ser Ser Ala Ser Gln Ser Ser Val Lys Lys Ala Ser Ile
540                 545                 550                 555

aaa ata ctg aaa aat ttt gat gaa gcg ata att gtg gat gcg gca agt     1850
Lys Ile Leu Lys Asn Phe Asp Glu Ala Ile Ile Val Asp Ala Ala Ser
                560                 565                 570

ctg gat cca gaa tct tta tat caa cgg aca tat gcc ggg aag atg aca     1898
Leu Asp Pro Glu Ser Leu Tyr Gln Arg Thr Tyr Ala Gly Lys Met Thr
            575                 580                 585

ttt gga aga gtg agt gac ttg ggg caa ttc atc cgg gaa tct gag cct     1946
Phe Gly Arg Val Ser Asp Leu Gly Gln Phe Ile Arg Glu Ser Glu Pro
        590                 595                 600

gaa cct gat gta agg aaa tca aaa gga tcc atg ttc tca caa gct atg     1994
Glu Pro Asp Val Arg Lys Ser Lys Gly Ser Met Phe Ser Gln Ala Met
    605                 610                 615

aag aaa tgg gtg caa gga aat act gat gag gcc cag gaa gag cta gct     2042
Lys Lys Trp Val Gln Gly Asn Thr Asp Glu Ala Gln Glu Glu Leu Ala
620                 625                 630                 635

tgg aag att gct aaa atg ata gtc agt gac gtt atg cag cag gct cag     2090
Trp Lys Ile Ala Lys Met Ile Val Ser Asp Val Met Gln Gln Ala Gln
                640                 645                 650

tat gat caa ccg tta gag aaa tct aca aag tta tga ctcaaaactt          2136
Tyr Asp Gln Pro Leu Glu Lys Ser Thr Lys Leu  *
            655                 660

gagataaagg aaatctgctt gtgaaaaata agagaacttt tttcccttgg ttggattctt   2196

caacacagcc aatgaaaaca gcactatatt tctgatctgt cactgttgtt tccagggaga   2256

gaatggggag acaatcctag gacttccacc ctaatgcagt tacctgtagg gcataattgg   2316

atggcacatg atgtttcaca cagtgaggag tctttaaagg ttaccaa                 2363


<210> SEQ ID NO 34
<211> LENGTH: 662
<212> TYPE: PRT
<213> ORGANISM: Homo Sapien

<400> SEQUENCE: 34

Met Arg Gly Ala Gly Pro Ser Pro Arg Gln Ser Pro Arg Thr Leu Arg
```

-continued

```
 1               5                  10                  15

Pro Asp Pro Gly Pro Ala Met Ser Phe Phe Arg Arg Lys Val Lys Gly
            20                  25                  30

Lys Glu Gln Glu Lys Thr Ser Asp Val Lys Ser Ile Lys Ala Ser Ile
        35                  40                  45

Ser Val His Ser Pro Gln Lys Ser Thr Lys Asn His Ala Leu Leu Glu
    50                  55                  60

Ala Ala Gly Pro Ser His Val Ala Ile Asn Ala Ile Ser Ala Asn Met
65                  70                  75                  80

Asp Ser Phe Ser Ser Ser Arg Thr Ala Thr Leu Lys Lys Gln Pro Ser
                85                  90                  95

His Met Glu Ala Ala His Phe Gly Asp Leu Gly Arg Ser Cys Leu Asp
            100                 105                 110

Tyr Gln Thr Gln Glu Thr Lys Ser Ser Leu Ser Lys Thr Leu Glu Gln
        115                 120                 125

Val Leu His Asp Thr Ile Val Leu Pro Tyr Phe Ile Gln Phe Met Glu
    130                 135                 140

Leu Arg Arg Met Glu His Leu Val Lys Phe Trp Leu Glu Ala Glu Ser
145                 150                 155                 160

Phe His Ser Thr Thr Trp Ser Arg Ile Arg Ala His Ser Leu Asn Thr
                165                 170                 175

Met Lys Gln Ser Ser Leu Ala Glu Pro Val Ser Pro Ser Lys Lys His
            180                 185                 190

Glu Thr Thr Ala Ser Phe Leu Thr Asp Ser Leu Asp Lys Arg Leu Glu
        195                 200                 205

Asp Ser Gly Ser Ala Gln Leu Phe Met Thr His Ser Glu Gly Ile Asp
    210                 215                 220

Leu Asn Asn Arg Thr Asn Ser Thr Gln Asn His Leu Leu Leu Ser Gln
225                 230                 235                 240

Glu Cys Asp Ser Ala His Ser Leu Arg Leu Glu Met Ala Arg Ala Gly
                245                 250                 255

Thr His Gln Val Ser Met Glu Thr Gln Glu Ser Ser Ser Thr Leu Thr
            260                 265                 270

Val Ala Ser Arg Asn Ser Pro Ala Ser Pro Leu Lys Glu Leu Ser Gly
        275                 280                 285

Lys Leu Met Lys Ser Ile Glu Gln Asp Ala Val Asn Thr Phe Thr Lys
    290                 295                 300

Tyr Ile Ser Pro Asp Ala Ala Lys Pro Ile Pro Ile Thr Glu Ala Met
305                 310                 315                 320

Arg Asn Asp Ile Ile Ala Arg Ile Cys Gly Glu Asp Gly Gln Val Asp
                325                 330                 335

Pro Asn Cys Phe Val Leu Ala Gln Ser Ile Val Phe Ser Ala Met Glu
            340                 345                 350

Gln Glu His Phe Ser Glu Phe Leu Arg Ser His His Phe Cys Lys Tyr
        355                 360                 365

Gln Ile Glu Val Leu Thr Ser Gly Thr Val Tyr Leu Ala Asp Ile Leu
    370                 375                 380

Phe Cys Glu Ser Ala Leu Phe Tyr Phe Ser Glu Tyr Met Glu Lys Glu
385                 390                 395                 400

Asp Ala Val Asn Ile Leu Gln Phe Trp Leu Ala Ala Asp Asn Phe Gln
                405                 410                 415
```

-continued

```
Ser Gln Leu Ala Ala Lys Lys Gly Gln Tyr Asp Gly Gln Glu Ala Gln
            420                 425                 430

Asn Asp Ala Met Ile Leu Tyr Asp Lys Tyr Phe Ser Leu Gln Ala Thr
        435                 440                 445

His Pro Leu Gly Phe Asp Asp Val Val Arg Leu Glu Ile Glu Ser Asn
    450                 455                 460

Ile Cys Arg Glu Gly Gly Pro Leu Pro Asn Cys Phe Thr Thr Pro Leu
465                 470                 475                 480

Arg Gln Ala Trp Thr Thr Met Glu Lys Val Phe Leu Pro Gly Phe Leu
                485                 490                 495

Ser Ser Asn Leu Tyr Tyr Lys Tyr Leu Asn Asp Leu Ile His Ser Val
            500                 505                 510

Arg Gly Asp Glu Phe Leu Gly Gly Asn Val Ser Pro Thr Ala Pro Gly
        515                 520                 525

Ser Val Gly Pro Pro Asp Glu Ser His Pro Gly Ser Ser Asp Ser Ser
    530                 535                 540

Ala Ser Gln Ser Ser Val Lys Lys Ala Ser Ile Lys Ile Leu Lys Asn
545                 550                 555                 560

Phe Asp Glu Ala Ile Ile Val Asp Ala Ala Ser Leu Asp Pro Glu Ser
                565                 570                 575

Leu Tyr Gln Arg Thr Tyr Ala Gly Lys Met Thr Phe Gly Arg Val Ser
            580                 585                 590

Asp Leu Gly Gln Phe Ile Arg Glu Ser Glu Pro Glu Pro Asp Val Arg
        595                 600                 605

Lys Ser Lys Gly Ser Met Phe Ser Gln Ala Met Lys Lys Trp Val Gln
    610                 615                 620

Gly Asn Thr Asp Glu Ala Gln Glu Glu Leu Ala Trp Lys Ile Ala Lys
625                 630                 635                 640

Met Ile Val Ser Asp Val Met Gln Gln Ala Gln Tyr Asp Gln Pro Leu
                645                 650                 655

Glu Lys Ser Thr Lys Leu
            660
```

<210> SEQ ID NO 35
<211> LENGTH: 162025
<212> TYPE: DNA
<213> ORGANISM: Homo Sapien
<300> PUBLICATION INFORMATION:
<308> DATABASE ACCESSION NUMBER: GenBank AC005730
<309> DATABASE ENTRY DATE: 1998-10-22

<400> SEQUENCE: 35

```
gaattcctat ttcaaaagaa acaaatgggc caagtatggt ggctcatacc tgtaatccca     60

gcactttggg aggccgaggt gagtgggtca cttgaggtca ggagttccag gccagtctgg    120

ccaacatggt gaaacactgt ctctactaaa aatacaaaaa ttagccgggc gtggtggcgg    180

gcacctgtaa tcccagctac tcaggaggct gaggcaggag aattgcttga acctgggaga    240

tggaggttgc agtgagccga gatcgcgcca ctgctctcca gcctgggtgg cagagtgaga    300

ctctgtctca aaaagaaaca aagaaataaa tgaaacaatt ttgttcacat atatttcaca    360

aatttgaaat gttaaaggta ttatggtcac tgatatcctg tttcattctt tatataatca    420

ttaagtttga aatgtatact tgcactacta acacagtagt taatcttagt cctacaagtt    480
```

-continued

```
actgctttta cacaatatat ttcgtaata tgtatgcact ggtgtttatg tacgtgttta    540
tgtttatatc tgttaaaatt agcagtttcc atctttttct attttgtacc atcacatcag    600
ttcagaagga ttgacagagc aaaatgattt gatgaagtat aaaagtcaca tggtgagtgg    660
cataaataca actctgaaca attaggaggc tcactattga ctggaactaa actgcaagcc    720
agaaagacac atatcctata tgtcaagaga tgtaccaccc aggcagttaa agaagggaag    780
tacacataga aagcacaatg gtgaataatt aaaaaattgg aatttatcag acactggatt    840
catttgctcc taaagtcaga gtcctctatt gttttttttgt ttttgtgggt ttcttttttaa    900
attttttttat tttttgtaga gtcggagtct cactgtgtta cccgggctgg tctagaactc    960
ctggcctcaa acaaacctcc tgcctcagct tcccaaagca ttgggattac agacatgagc   1020
cactgagccc agcccagacg ctttagcatt tatgaagctt ctgaaatagt tgtagaaacc   1080
gcataagctt tccatgtcac tttcaaagtt tgatggtctc tttagtaaac caaccaagtt   1140
attcctcaag ggcaaaataa catttctcag tgcaaaactg atgcacttca ttaccaaaag   1200
gaaaagacca caactataga ggcgtcattg aaagctgcac tcttcagagg ccaaaaaaaa   1260
aggtacaaac acatactaat ggaacattct ttagaagagc cccaaagtta atgataaaca   1320
ttttcatcaa agagaaaaga gaacaaggtg ttagcaaatt cctctatcaa ataacactaa   1380
acatcaagga acatcaatgg catgccatgt ggaagaggaa gtgctagctc atgtacaaac   1440
cagtagataa tttcaacttg ctgccgaatg aaacctcttt gcaaggtatg aatcagcact   1500
tctcatgttt gttttgcttt gttttgtttt gtttttagag acaggccctt gctctgtcac   1560
acaggctgga gtgcagtggc acgatcagag ctcactgcaa cctgaaactc ctgggctcaa   1620
gggatcctcc tgccttagcc tcccaagtag ctgggactac aggcccacca tgcccagcta   1680
atttttaaa ttttctatag agatgggatc tcactagcac ctttcatgtt tgatgttcat   1740
atacaacgac caaggtacaa tgtggaaaag ggtctcaggg atctaaagtg aaggaggacc   1800
agaaagaaaa ggggttgcta catagagtag aagaagttgc acttcatgcc agtctacaac   1860
actgctgttt tcctcagagc agagttgatg atctaaatca ggggtcccca acccccagtt   1920
catagcctgt taggaaccgg gccacacagc aggaggtgag caataggcaa gcgagcatta   1980
ccacctgggc ttcacctccc gtcagatcag tgatgtcatt agattctcat aggaccatga   2040
accctattgt gaactgagca tgcaagggat gtaggtttc cgctctttat gagactctaa   2100
tgccggaaga tctgtcactg tcttccatca ccctgagatg ggaacatcta gttgcaggaa   2160
aacaacctca gggctcccat tgattctata ttacagtgag ttgtatcatt atttcattct   2220
atattacaat gtaataataa tagaaataaa ggcacaatag gccaggcgtg gtggctcaca   2280
cctgtaatcc cagcacttcg ggaggccaag gcaggcggat cacgaggtca ggagatcgag   2340
accatcctgg ctaaaacggt gaaaccccgt ctactaaaaa ttcaaaaaaa aattagccgg   2400
gtgtggtggt gggcacctgt agtcccagct actcgagagg ctgaggcagg agaatggtgt   2460
gaacctggga ggcagagctt gaggtaagcc gagatcacgc cactgcactc cagcctgggc   2520
gacagagcga tactctgtct caaaaaaaaa aaaaaaaaaa aaagaaataa agtgaacaat   2580
aaatgtaatg tggctgaatc attccaaaac aatcccccca ccccagttca cggaaaaatt   2640
ctcccacaaa accagtccct ggtgccaaaa aggttgggga ccgctaatct aaataatcta   2700
atcttcattc aatgctaaaa aatgaataaa ctttttttta aatacacggt ctcactttgt   2760
```

-continued

tgcccaggct ggagtacggt ggcatgatca cagctcactg tagcctcaat cacccaggcc 2820

ccagcgatcc tcccacctaa acttcctgag tagctgggac tacaggcacg caccaccatg 2880

cccagctaat ttttaaattt tttatagaga tgggggtctc accatgttgc ccagactggt 2940

ctcaaaccct gggctcaagt gatcctccct caaactcctg gactcaagtg atcctccttc 3000

cttggcctcc caaagtgctg ggattacaag catgagccac tgtacccagc tggataaaca 3060

ttttaagtcg cactacagtc atggacaatc aggctttca acatgcagta tggacagtga 3120

gtcccagggt ctgcttttcc atactgaaat acatgtgata ctaaggagaa aggtgctcgc 3180

aaggatattt aaaatgaaga atatttaaaa tgaggaaaaa actgtttctt catgactttg 3240

ataaggctga taaagaccat ttctgtgatc tcaggtgatt cactcaagta gtatatttca 3300

gtaatcatta tctggaacag cctgaatctt aaccaaaata ccatgatttt ttaatgctgt 3360

tatgatacct tgatgatatg accaaactgc aatgtaggca gctaaatctc cacgagtttg 3420

acttccccga gagttgacag ttttcttcac aaattaaaga aatatatttt ttgatacatg 3480

attggcatat ttaaaaacta cactgaaatg ctgcaaaatg atataaagaa acattttcca 3540

gaatcaaatg caatcaaaga gtggattagg aatctactca ccattatcaa ctaaatagaa 3600

acacttggac tgggtgtggt ggctcacatc tgtaatctca gcactttggg aggccaaggc 3660

aggtggattg cttgaggcca ggagctcaag accagcctga gcaacatagc aaaactctgt 3720

ctctacaaaa aaaaaaaaaa attaaccagg catggtggca gatgcttgta atcccagcta 3780

ctctggaagc tgaagtagga ggactgcttg agcccaggag atcaagactg cagtgagccg 3840

tggtcatgct gcgccacagc ctgagtgaca gagagagacc ctgtctcaaa aacaaaaaca 3900

aacaaaaaac acttaacctt cctgtttttt gctgttgttg ttgttgtttg tttgttttga 3960

gatggagtct cactctgttg cccaggctgg agtgcagtgg cgtgatcttg gctcactgca 4020

agctctgcct cccgggttca cgccattctc ctgcctcagc ctcccgagta gctgggacta 4080

taggcgcccg ccaccacgcc cggctacttt tttgcatttt tagtagagat ggggtttcac 4140

cgtgttagcc aggatggtct tgatctcctg acctcgtgat ccacctgcct cggcctccca 4200

aagtgctggg attacaggca tgagccaccg cacccggcca acctttctgt tttttagttt 4260

gatatgcttg ttaactcagc agctgaaaga atgctgaaag tggccttcag taaaaaaatt 4320

tcactagaat ctctacatcc atatttaatc tgaatgcata tccagattga tcagttagag 4380

caaaaacact catcatcatt cctgatgacc tctaattctg gtttcggctt tctatttcaa 4440

tggaaacaga ataaggaaag aaatggaagg gctctggaaa tttgtcctgg gctatagata 4500

ctatcaaaga tcaccaacaa taagatctct cctataaata taaaacaagt ataattaatt 4560

ttttaattat ttttttctct tcagaggatt ttatttcaag ataaaacata acttctaccc 4620

atactattga ttccaaaggt tagaaaaagt gtttttcctc atcttatcct tcaaagaggt 4680

cacagcaatg caaacatcta taaaatgcct ctgcataatt gtcagaagct atagtccaga 4740

aatcattgaa aatgcttttc cattttaagc ttaggtgagg tgtcttagga aacctctatg 4800

acaacttact ctatttattg ggaggtaaac tcccagactc tcccagggtc tcctgtattg 4860

atctcatttt ttaggcttcc taatcccttg aagcacaatc gaaaaagccc tggatctctt 4920

ttctgcacat atcatcgcgg aattcattcg gcttccagca agctgacact ccatgataca 4980

agcggcctcg cccttctccg gacgccagtc cttgctgcgg ttagctagga tgaggggttt 5040

-continued

gctgggcttc agtgcaggct tctgcgggtt cccaagccgc accaggtggc ctcacaggct 5100

ggatgtcacc attgcacact gagctcctgg caggctgtac caatttttta attatttaat 5160

atttatttt aaaattatgg tgaatatttt ggtattctgc tctaaaatag gcccataaat 5220

gcacagcaga tatctcttgg aacccacagc tttccactgg aagaactaag tatttttctt 5280

ttaaagatgc tactaagtct ctgaaaagtc cagatcctct acctctttcc atcccaaact 5340

aagacttgga atttatgaga gatctagcta acagaaatcc cagacacatc attggttctt 5400

cccagagtgc agtcctccta aagaggctca gccctaagca ggcccctgca ccaggagggt 5460

gggtctgaga cccacatagc acttcccaag gtgcatgctc cagagaggca ctgaaacagc 5520

tgagcacaag cctgcaagcc tggagaactc tcacagtcag aacggagggg gcccagtggg 5580

actaacataa agagaaaagg gaacacagag aaatggatgg caccaacaac cagcaaagcc 5640

ttcatggcca atgaaagcat cagtgacggg gccagaaccc tcatccccaa agactcttca 5700

ctgcctttag tgaaaaacaa tggctagaga gtgaagttat gatcatgtat agagaggtaa 5760

agttacattt ttatattctg actctgctaa tgtgaaattc cctatctgct agactaaaag 5820

tttcagacac cctgttcaaa tatcccatta gttgctagag acttaaaatg aacagaacgc 5880

acattgtcag gatgactatt accaaaaaat caaaagacag caagtattgg tgaggatgta 5940

gagaaactgg aacttttgtg cactgtttat gagaatgtaa aatggagcag ctgctgtgga 6000

aaagagtatg caggttcctc aaagagtaaa accaagatgt ggaaacaact aaatgcccat 6060

cagtggatga aggggtagac aatatgtggt atatacatac catggagtac tattcagcct 6120

ctaaaaaaaa aaaaggaaat tctataacat gcaacagcat ggatgaatct tgaggacatt 6180

ttgctaatga aataaggcag tcatagaaag acaaatactg cacgactcca cttatatgag 6240

ataccaaaaa tagacaaatt catagaatca aagagtacaa tggaggttac ctggagctgc 6300

agggcgggaa acgaggagtt actaatcaac gaacataacg ttgcagttaa gtaagatgaa 6360

taagctctca agatcagctg tacaacactg tacctagagt caacaataat gtattgtaca 6420

cttaaaaatt tgttaagggt agattaacaa atgtagtaga tccacaaatg tggttaagtg 6480

ttcttaccac agtaaaataa aaaaagaata tcaagcccag gagttcgaga ctagcctggg 6540

taacatggtg aaaccctgtc tctacagaaa atacaaaaat tagccagctg tggaggtgca 6600

ctcctaggga ggctgaggtg ggaggcttgc ttgagcccag gaggtcaagg ctgcagtgag 6660

ccatgattgc accactgtac tccagcccag atgacagagc aagacaccac ccccccaaaa 6720

aaaagaaaaa gaatatcaaa cattttaaaa gatcagatac gcaagaacaa caacaaaaaa 6780

gagatgaaca gagcatcgac cctcatctag tgggattctt ggtctaactg aaaaacagac 6840

attgagagac aaacaatgac agtgatgtga tcacagcaat tacacaggta tcccctgggg 6900

actgcagaag aaaggaggaa tgcctaactt tcagaaaata gagaaagcgt caaacagttg 6960

gtgaaagcct tccaaaacta gagagaactg cacacaccaa atcacagaaa gaagaaaagc 7020

cgtgggagat tctgggaccc accggctatt tttgatggct gaacaccctg ctgcaggaga 7080

gacaggagct ggaaagcatg gtgggatgaa acctcaaaca gctttgcctg cattgcttaa 7140

gatgactggg cttgattaac tctagtcaat ggggacaatt caatcaaaga agaaagatgc 7200

tcaaattcac attttagaat gatttttat ggcagtatgg ggaatagatt aaaagagagt 7260

gaagctggag gcaagaaact tgttaagagg caactgaaac agtctagatg ataaataata 7320

-continued

aactgacaga gtgactagaa aaatcagaac aggctgaatc aacagatacc tagatgaaaa 7380

taacaggact tgatcaccag ttgtatcttg gagaggaagg agttgtttcc ttgctttccc 7440

tacgactggg aatacggaag gtttgccgtg tgtattggtt atatactggt gtgtagccaa 7500

tcactgacaa ccatttagca gcttaaaaca caaaggctta tctcccagtt tctgtgggcc 7560

aggaatctaa gataggctta gctggctggt tctggctcag agtttctcaa gaggttgcaa 7620

tcaagatgtc agctggggtt gcatcatctg aaggctcaac tggggccgga gggtccactt 7680

ccaaggagtt cactcacctg cctgacaagg cagtgctggt tgttggcagg agatctcaat 7740

tcattgccaa gtgagcctct ctatagcatt gctggaacat cctccccatc tggcagttgg 7800

cttctctcag catgagtgat ctgagagaga gagcaaggag gaagccacag tgttcttcct 7860

actcctactc ctaacactat ggacctactc ctaacactct cacttctgcc ttattccatt 7920

agttagaaag ggaactaagc tccacctctt gaaataagaa gtgtcaaaga atttgtggat 7980

atatttaaaa atcatcacac tgtggaagtg gatagggggt tcaattaatg ctgaacttga 8040

aatgcctgag acattcaaat gtccaacagg caatgaacat acccatagat ggtcatgact 8100

ttagcaagaa tagaggaaga tcacagaatt aaggaggaat tgaaaggtaa aagaagtgga 8160

gtcagattcc ccctgaaaag tgagccatga aaggaacttt aactattgag ttagaggtca 8220

gagtaggaaa tttcggtgga attcttttt aaagaaagga accatataag catgttttga 8280

ggtagaggga gaataaatca gtagacaggg agaggtaaaa aacataaatg atagggata 8340

gttgacaaag gtcttggcag aatcccttac ccattgactt ggggccaaga gagggacact 8400

tctttgtttg agggataagg aaaataagaa agaatgggtg ctatttagtg tggtcctgtc 8460

tctagggcaa acgcataggt aacaaactgt gtgtgttagg aatatagatg tgacctcaca 8520

ttgagattct cacctcaaat ccattttgtt gttacctgta ccttcctacc ttctctttt 8580

gctacatgca gactgctgtt ttgtcttcct ggcctgttcc aggtttcagc attctggcat 8640

atctgctacc ctgttcccaa acctctctag agtccatgct ccttccttgg atagtgtttg 8700

attgggccac gtatctaaga agtgatgcct tcagttaggc ctgagaacct cctctatgga 8760

aatctccatc agtgaccctg acagacttgg tatcttggag atgtcactgc tcccagcctg 8820

tggtctagga gaatctcagc ctgggcctct agtagtatgg ataaggcgtt aaggtatctt 8880

tgaaccagag tctgtcatat tcctcaatgt gggacagata aaacagtggt agtgctggtg 8940

tttctgagct agaactctgg tttttggtct agattctttg atgtatgacc tttcagaggt 9000

attaaaattt gttctaatac aatgttcaat acaaatgtag ttccttttct gttaggacct 9060

caacaaaaca tgaccaactg tagatgaaca ttaaactatg acaattcatg gaaatgaata 9120

cagtaatacc tgcggttccc ccattttagc agtcactatg gtgacatttg gcacaaatgg 9180

ctatttaagg gtgcttttgt taaaacctac catcttacta ggcacatgat attgaaacta 9240

atgaaataat ggagaaactt cttaaaaact tttaatgaat aaagtgatga agtgataata 9300

ttttagctgc tatttataaa gtgactatta caggtcaaac attcttctag ggtttttttg 9360

ttgaagttgt cacatttaat ccttaataac ccactatgag tcaggtattc ttctctcccc 9420

tttggacagt tggggaaatg ggggtcagag aggttaggta atttgctcag ggccacacaa 9480

cctgcatgta gaaaatctga gatttgtaca ggaacgtatc aaactctgaa gtccatgctt 9540

ctattttccc atgctgcctt tctaataaaa ggtaactaat gctactggat gctgccccca 9600

-continued

```
aagtgagtca ctttcacccc accctacttg attttctcca taaaactaat cacatcctga   9660
caacttattt attgctgatc tccccctacta gattataaac tcaataaaag caagatcctt   9720
gtctgctgaa tatcagtacc taaaacgctg tctagcacag agcaagtaat taatatttgt   9780
tgaatgaaca aataaaggaa aaaaattcaa aggaagaaaa agccctaaaa cagatgttta   9840
cctaaacata cattttaaaa gaaagcatat aacaaattca ggacagaatt taaatttgat   9900
tttttaaaga aataaccaag tgctagctgg gcacagtggc tcacacctgt aatcctagca   9960
ctctgggagg ccgaggcagg cagatcactt gaggtcaaga gttcaagacc agcctggcca  10020
acatggtgaa acctgtctct actaaaaata cagaaattat ccaggcatgg tggcaggtcc  10080
ctgtaacccc agctactcag gaggctgagt caggagaatt gcttgaaccc aggaggcaga  10140
ggttgcagtg ggccaagatt gcaccactgc actccagcct gagtaacaaa gcaagactct  10200
gtctgaagga gaaggaaaga aagaaggaaa gaaggaaaga aggaaagaag gaaagaagga  10260
aagaaagaaa gaaagaaaga aagaaagaaa gaaagaaaga aagaaagaaa gaaagaaaga  10320
aagaaagaaa aagaaagaaa gaaagaaaga accaagtgct tatttgggac ctactatgct  10380
atgtttttcc atgcacgcta ttttcagtaa agcagttagc aaacttgcaa gatcataaca  10440
acaaatatat gcttctataa ctctaaaatt gtgctttaag aagttcctct ttaccagctc  10500
atgtatgcat tagttttcta agagttacta gtaacttttt ccctggagaa tatccacagc  10560
cagtttattt aaccaaagga ggatgcttac taacatgaag ttatcaaatg tgagcctaag  10620
ttgggccagt tcatgttaat atactccaga acaaaaacca tcctactgtc ctctgacaat  10680
tttacctgaa aattcatttt ccacattacc aaggagccag ggtaggagaa tatagaaaga  10740
ccacccaaga atccttactt ctttcagcaa aatcaattca aagtaggtaa ctaaacacat  10800
gccctaacaa tgaatagcag attgtgctca gaagaatgat ctacaacatc ttactgtgaa  10860
ggaactactg aaatattcca ataagacttc tctccaaaat gattttattg aatttgcatt  10920
ttaaaaaata ttttaagcct aaattttaaa aggtttgata ttggtacatg aatagacaaa  10980
cagacatgga ctagaccaag aattaggttc aaacatatac aggaatttaa tatacgataa  11040
atctagtatt ccaaaggaac caacaaatgg tgttcagaca gcaggatagg catcaggaaa  11100
aacacagttg ggcaccctac cttactccta acaccaggag taactgaagg agcaccaaat  11160
atttatttat tttaattata gttttaagtt ctagggtacg tgtgcacaac atgcaggttt  11220
attacatagg tatacatgtg ccatgttggt gaggagcacc aaatatttaa aagaaaaaaa  11280
ttggccaggg gcggtggctc acacctgtaa tcccagcact ttgggaggcc aaggtgggca  11340
gatcacctga ggtcgggagt tcgagaccag cctgagcaac atggagaaac cccatctcta  11400
ctaaaaatac aaaattagcc aggcatggtg gcacatgcct gtaatcccag ctacttggga  11460
ggctgaggca ggagaatagc tttaatctgg gaggcacagg ttgcggtgag ctgagatatt  11520
gcactccagc ctgggcaaca agagcaaaac ttcaactcaa aaaaattaat aaataaataa  11580
aaataaagaa agaaaagaaa aaaatgaaaa tagtataatt agcagaagaa aacaccgtag  11640
aatcctcgga ctcttaggat ggggaatgcc tataatataa aaaccctgaa gttataaaag  11700
agaaaatcac ctacatacaa accaaatctt tctacatgcc taaaacatag cacaaacaca  11760
gctaaataat catagctgaa tgaactggga aaacaaaact tgactcatat ccagacagag  11820
ttaattttcc tacacataaa gagtacctat ataaacccaa caaaaaaacc accactaacc  11880
```

-continued

caaaataaaa atgtgacagg taatgaacag gtagttcaca gagaatacaa atggctcttc 11940

ggcacataag atgctcagac tgacttttac ttatttattt tttgagagac agggtctcac 12000

gatgttgccc aggttaggct caaactcctg ggctcaaatg atagtaccag gactacaggt 12060

gtgccccacc gcacctggct cctcaaccac ctgtattaac aggaaatgca aaataaaact 12120

ttcaaatcta ttttacctat tagaatggca aaaatttgaa aaacttcaaa catcatcatg 12180

ttggtgagaa tgtgaggaga ctggcactct catttttgc tgatagcata tatatactga 12240

tggcttctat ggaaagcaat ctggcagcgt ctatcaaatg tacaagtgca tatatccttt 12300

gacaaagcaa ttccactcta ggaatgtgtt ctatatggtt gtgcttcctg gggctgggaa 12360

ctgggagcta agggacaggg gcagaagata atcttctttt ccctccttcc ccgttaaaca 12420

tgttgaattt tatatactgt aatatattat ttttcacaaa agataatttt taagcgatat 12480

gtctgggaat ttttttttt cttttctgag acagggtctc actctgtcat ccaggctgga 12540

atgccatggt atgatctcag ctgactgcag cctcgacctc ctgggttcaa gcaatcctcc 12600

cacctcagcc tcctgagtag ctgggactac aggcacgtgc catcatgcta atttttgtat 12660

atacagggtc tcactatgtt gcccaggcta atgtcaaact cctaggctca agcaatccac 12720

ccacctcagg ctccaaagtg ctgggattac aggcgtgagc caccgcgcct ggccctggga 12780

attcttacaa aagaaaaaat atctactctc cccttctatt aaagtcaaaa cagagaagga 12840

aattcaacct ataatgaaag tagagaaggg cctcaaccct gagcaacaaa cacaaaggct 12900

atttctgaga caggaatttg ctgaacaaaa tcgagggaag atgacaagaa tcaagactca 12960

cttctcggct gggcgcagtg gctcacacct gtaatcccag cactttggga ggccgaggcg 13020

gacagatcac gaggtcagga gattgagacc atactggcta acacagtgaa acccagtctc 13080

tactaaaaat acaaaaaatt agccgggcgt ggtggcaggt gcctgtagtc ccagctactt 13140

gggaagctga ggcaggagaa tggcgtgaac ccaggaagcg gagcttgcag tgagccgaga 13200

tcacgccact gcactccagc ctgggtgaca gagcaagact ctgtctcaaa aaaaaaaaaa 13260

aagactcatt tctctagatc ttgagccgta ttcaaattta tctcagctta gtgagaggtt 13320

aaagcaagga atatccttcc ctgtgggccc tgctccttac tgaaggaagg taacggatga 13380

gtcaaggaca ccaatggaga aaagcactaa caccattatc tgatgaacat tacgtgaaga 13440

agggtaagaa gtgaagtgga attgctgaag aagtcagtga aagcggacat tcatttgggg 13500

aaatggaata taggaaatcc ataaaagtga ttaaaaagat gttagaggct gaggcggggg 13560

gaccacaggg tcaggagatc gagaccatcc tggctaacac ggtgaaaccc catctctact 13620

aaaaatacaa aaaattagcc aggcgtggtg gcaggcacct gtagtcccaa ctactcggga 13680

gactgaggca ggagaatggc atgaacctgg gagacggagc ttgcagtgag ccgagatcac 13740

gccactgcac tccagcctgg gtgacagagt gagactccat ctcaaaaaaa aaagttagat 13800

acgagagata aagatccaac agacacacaa ctgctaattc tgaacagaac aaaacaaatg 13860

gcacaggaaa agaaaattta agatataaca ccggaaaact ttcctgaaat tgagtaactg 13920

aatctatagc ttgaaagggt ttagcatatg ccaagaaaaa tcagtagagt ccaaccagca 13980

caagacacat ctagcaaggc tggtgattct accaacacag agaaagaagt gggtgaccca 14040

taatgcggaa aaaggcagac catctgcagt cttctccaga acactggagt ctgaagacaa 14100

aagaatgctg cctactgagc cagaagggag agaaagtgac ccaacacatc tttaccaagt 14160

-continued

tagaatgtca cgcattattt aaaggctgca aaagccatga aagacatgaa agaacacaag 14220

catttacaac atgaaagaac acaagcattc tcatactcaa gaatccttaa gaaaaatgta 14280

gtcctaatcc agcccactga aagttaaatg tacttaatgt gctcattaat gggaacttca 14340

tagcttcaaa tcagtctggt cccatctacc aacatctctc gcccggcttt cctgcaatag 14400

tcagcacctt tccctcctcc cagtcttgtc ccctggagtc tgctctcagc atagcagagt 14460

gaccacatca acacccaagt cagagccctc cagtgcgcac tggtctacaa agcccttccc 14520

acccccacc ccacgtgccc tccggatcct tgtgacgtgt ctcctgcata ccctagcagc 14580

cctggcctcc tcactgcccc tcctgtacat caggaaggcg actccttgag tcttggctct 14640

ggccgcctcc tccacctgca gtgagttaac tcccttacct actctaggtc attgctcaaa 14700

tgtcagcatc tcaatggggc cctccctgac taccctattt aaattctaca tactcccctt 14760

gaccccatgg acctcactca ccctattcca cttttattct tacaatttag cacttgttct 14820

cttctaacgt attctaagac ttactcattt attacattgt ttgccacccc ctctagtaca 14880

taaactccag aggggcaggg atttctgtct atttattcat ttctttatcc ctaggacata 14940

gaacagggca tagttcagag tattcaatgt tatcaatgaa tgaactagca gtagtaccag 15000

ttccagttag gcacagaatt aaatctaaat agaattaaat ctcatggtct gggttaacta 15060

tggatagaaa attagatata attttaagaa gcctagaaag aaaaaattaa taatgtaaaa 15120

ataatattaa tttgataata ataacaaaaa ctctgccagg cactgtggct caaatctgca 15180

atcccagcta ctcaggaggc tgaggtggaa ggatcacttg agaccagagt tcaagactca 15240

gcctaggcaa cacggcaaga aactgtctct aaaaaaatta aaacttaaat ttttaaaaaa 15300

gaattctcaa agcgtcacaa aaactggaga ttaaggtaca ggaagtgtga agtaatatta 15360

ctatgctaat ggtttttttt ttttttagaa aggtataacc aaaagatttc tttctcaagt 15420

cgataaactg agaaagataa gcatatcttc caattaacag aggggagga aaagccagat 15480

acaacaaaat aagatataaa ttagtttcca gttgaaaaca agagtaggag ttattttgca 15540

tcacctcacc tgtgacctcc cccagcccaa aaaacactac tgataaacag ggtagaaaag 15600

catcatctca gataaagcag gaaaaactgc cacagtctca aaccacaaac tataagcaca 15660

cacctggcca accctgccaa gtctgggctc agtaggagga acgtgctgag agctaggatg 15720

taccaactta gacattctgt gggatacaga tgtccctgga agggtcacac catctcaaag 15780

gcacctgtaa tgcccactga ttacagccac catatgtgag agagaaactc agggcactta 15840

gagagtataa caagaacctt atgtcatctg agatgaggaa tcctcagccc tgcaaattaa 15900

ccaactcttt agaacaactg gcaaaacata aatatccaca acttttgttt cagtaattcc 15960

actcttagat atcaatccaa agtacatgag acagcagata cacacacaaa atggtattta 16020

ctgcagcatt gtttataata gcaaaaaaca agaaataatc catatgtctc aataggatac 16080

tgggtacatg agggtatgta cccatcattc aaccatcaaa aagagtgata tggatgtcca 16140

cagatggaca taaaaagctg tgtgttacgt gaaaacaaac tcaagcagca gcaggatggg 16200

cttatgatag tcagtatgag ctaatttctg gaaaaaaaaa tctagtgtgt gcacagaaaa 16260

catctgaaag aacagaaaca aaactatcag cagaatattg agatgtttta ctaagttgta 16320

tatctatact gcttgtaatt tttaccccaa gcaagaatta ctttttggaa aaagaaaatt 16380

caggaaataa agcatttctt taaacttcat gtttaaacaa atggtgatgg aataaaagag 16440

-continued

ttcttattca tcataaacac acacagcaca catgcacgca tgtgcgtgag cacacccttt 16500

acttgataaa taccatgttg aatattttag tctttccttt taggttctat cccttcactc 16560

aaaatgcggt tataaataaa tgtacttttc atgtgccttc tgcctaaacc cactttaata 16620

taactttaca gtcccattat cattatagtc tcaaagctag actcagcctg aaactaccct 16680

ttcatttgga acccttatta aaatgccaca tacagctcct tcaaataaaa acaaacccta 16740

ggacctgaca ctaggcttcc tttgttgcta ctcataatgg ccaagttctg tgcttataat 16800

acatcttctt tcattttatt gctacatatc caagggtttt atatgttttt cttattatat 16860

cttaattcaa aacaccatca cgctcttttc cagatgaaaa taaggaaaag aaattgagca 16920

actgactgac ttaaaggtca taaaactata tagtagcaga gtcagcaaaa gaagaaacac 16980

acatctccca agtagaggct gaaaaccagt accattcacc tccagggtga gctatataca 17040

gattacaaag tcaccttctc taaatgttca aactgaatcc catacccata ctttaccact 17100

acctcgtaag aacagcctca gatcttgtta tagccttttt tttagcatgc tgaagccaat 17160

aaaatgcttc ccattcagca agagaaacaa gttctgaaac actgaataat ctgcccaggg 17220

cctatgaaca tttccactgt gagaaatgtt ctccactgtg tggagaagat ccttactctt 17280

ctccacacag gcagaacatt agaaaaattc ttggattcta tgatgcacag cttaggagtc 17340

tgtttagcac aatttaagtc caaatagtta ttaaatcctc ctctgttcca gaaacagtgc 17400

taaatactgt gaatataaaa attgaaaaga tactctcctg gctcccaaga aagtcagcca 17460

gatagaggag acacaggcac acaaatcact gtcacatgaa gctctacctc cctaacttca 17520

aacgagggcc taagtcacca agaatacagt agcagttgtg actacgagta actactataa 17580

ttcaatactt tatcttccct tagaaaactc ttctcccttg gaaatttatt tgcatttcta 17640

aataccattc cttactaaaa ggaagcaggg ctccttgggg aaatagctga ttctaggtgt 17700

ggactatgaa atgaaaatgg tgagtctggg acatcccatg ttgcccagaa atcaaggaac 17760

tgcccaaaga ttaacagagt catgttaaat ggacctaaga gtgaaccaga aggagctcac 17820

tttgccccgc gtggaacaat ttcaagaaaa acatgacagt aatgaattat aaaacatgaa 17880

ttaaaataca tattggtact aaaaagagaa caaaaggatg tggctttgga taaagctctt 17940

cttcatggaa gaataccagc taataaatgt aaaggaaatg agagaattag aaaaattatc 18000

attttgtaaa ccttaatata ttcacctaga catgctaaaa ccactgagta aaaggctgct 18060

tgggaagagg atgctcacat gatctcagag tttcacacca cagataattt attagataca 18120

ggaaggaaga tgtgatcaag cttcctgtga cccccagcca ggccccacaa cactatgtgc 18180

ctccttgtga tgtgggagct acacagcatc gcccacacag cttctcgcca aaactgtttg 18240

aagctaatca caagggaaga actggacagc ttctgaccat gagacgctcc accagacaac 18300

ttgcttggcc tctccaaaga aacttgcttg gcctctccaa agaaaactca gtttcattta 18360

aaaacaaaac taattattta aaaacaaacg aaaagcaagt tgtggacttg agctccaggg 18420

acagagcaga catactttc cctgttcttc ccagtaagtg gtaataaaaa ccctcaacac 18480

tagatataaa acaaatataa gaaggttctg gaaggggaag aggaggcaga ctatccaggt 18540

gccttgaggc ccacagaaca acccagtgat gggttcactg ggtcttcttt ttgcttcatt 18600

atctcagact tggagctgaa gcagcaggca acttcaaaac accaaggggc acagattgaa 18660

aagccccaag aaaagcctgc cctctctagc caaaggacca ggaaggagac agtctaatga 18720

-continued

```
gatggaacac atttagacag taactgccca tttaccagca ataactgagc agggagccta  18780
gacttccagt cttgtgagga cgtaccaagg tacccaacac ccccaccaag gctgagtaag  18840
gactgcgact tttatccctg catggcagta gtaaggagcc catccctcac ccgccagcag  18900
tgtcagggga acctggactt ccactcccac ccaggagtga tgaggccctc cctgctgggg  18960
tcatgtcaga ggaggcctag tggagattca gtgacttaac cttttcccag agataatgag  19020
gccacctttc ctcccctcttc ccccatggtg acagtgaaag cactgtggca agcagtaggc  19080
actcctaccc ctcctagcca gggaggtatc agggaggcca agtagggaac cagaataccc  19140
acaaccaccc agcagcaaca ggggtccccc accccattgg gtgtcaatgg aagcagagcg  19200
gaaagcctgg atatttaccc ccatctagaa gtaacaagct gatgtccccc ttcttctact  19260
acaatggtgt tcaaaacagg tttaaataag gtctagagtc tgataacgta atacccaaat  19320
cgttgaagtt ttcattgagg atcatttata ccaagagtca ggaagatccc aaactgaaag  19380
agagaaaaga caattgacag acactagcac taagagagca cagatattag aactacctga  19440
aaggatgtta aagcacatat cataagcctc aacaggctgg gcgcggtggc tcacgcctgt  19500
aaccccagca ctttgggagg ccgaggcagg tggatcacaa gatcaggaga tcgagaccat  19560
cctggctaac acggtgaaac cccgtctcta ctaaaaatac aaaaaaaaat agcaaggcat  19620
ggtggtgggc acctgtagtc ccagctactc gggaggctga ggcaggagaa tggcatgaac  19680
ctgggaagag gagcagtgag ccgagatcgc accaccgcac tccagcctgg gcaacagagc  19740
aagacttcgt cccaaaaaaa aaaaaaaaaa aaaaaaaagc ctcaacaaac aactacaaac  19800
gtgcttgaaa caaatgaaaa aaaaatcttg gcaaagaaat aaaagatata tattttggcc  19860
aggtgcagtg gctcacagcc tgtaatccct gcactttggg aggctgaggc aggcggatca  19920
cctgaggtca ggagtttgag accagcctga ccaacatgga gaaaccccgt ctctactaaa  19980
aatacaaaat tagccagtca tggtggcaca tgcctgtaat cctagctact caggaggccg  20040
aggcaggaga atcgcttgaa ctcaggaggt ggaggttgcg gtgagccgag atcccgccat  20100
tgcacattgc actccagcct gggcaacaag agcaaaactc catctcaaaa aaatagatac  20160
atattttaat ggaaatttta gaattgaaaa atacagtaac caaattgaat ggaaagacaa  20220
catagaatgg agggggcaga caaaataatc agtgaacttc aacagaaaat aatagaaatt  20280
acccaatatg aagaacagaa agaaaataga ctggccaaaa aataaagaag aaaaaagagg  20340
agcagcagga ggaatgatgg aaaaagagaa aggaaggaag gaagggaagg agggagggaa  20400
ggagtgaggg agaaagtctc aaagacctct gagactaaaa taaaagatct aacacttgtc  20460
atcagggtcc aggaaagaga caaagatggc acagctggaa acgtattcaa aaaataatag  20520
ctgaaaactt cccaaatttg gcaagagaca taaacctata gattcgaaat gctgaacccc  20580
aaataaaaag cccaataaaa tccacaccaa aatacatcat agtcaaactt ctgaaaagac  20640
gaaaagagaa aacgtcttga aagcagtgag tgaaacaaca cttcatgtat aagggaaaaa  20700
caattcaagt aacagatttc ttacagaaat taaggaagcc agaaggaaat gacacaatgg  20760
ttttcaagtg ctgaaagaaa agaagtgtca acacaaaatt ctagattcag taaaaatatc  20820
cttcaagaat caatgggaaa tcaagacagt ctcagataaa gcaaaataag agaatatgtt  20880
gccagcagat ctcccctaaa ggaatggcaa aaggaagatc atgcaacaga ccaaaaaatg  20940
atgaaagaag gaatccagaa acatcaagaa gaaagaaata acatagtaag caaaaataca  21000
```

-continued

tgtaattaca ataaaatttc tatctcctct taagacttct aaattatatt gatggttgaa 21060

gcaaaaatta taaccctgtc tgaagtgctt ctactaaatg tatgcagaga attataaatg 21120

gggaaagtat aggtttctat acctcattga agtggtaaaa tgacaacact gtgaaaagtt 21180

acatacacac acacacgtaa gtatatataa atatatgtgt gtatatgtgt gtgtatatat 21240

atatatacat ataatgtaat acagcaacca ctaacaacac tatacaaaga gataataacc 21300

aaaaacaatt tagataaatt gaaatggaat tctaaaaaat attcaaatac tctacaggaa 21360

gacaagacaa aaagagaaaa aaagaggagg acaaactaaa ttttttaaaa acataaataa 21420

aatggtagac ttaagcccta acttatcaat aattacataa atgtaaatga tctaattata 21480

tcaattaaaa gacagagata gcagagttaa tttaaaaaca tagctataag aaacctgctt 21540

tgggctgagt gcagtgactc acacttgtaa tcccagcact tcgggaggcc aaggcgggtg 21600

gatcacctga ggtcaggagt tccagaccag cctggacaac atggtaatac cccatctcta 21660

ctaaaaatac aaaaaaatta gccaggcatg gtggcacacg cctgtagtcc caactactca 21720

ggaggctgcg acacaagaac tgcttgaacc cgggcagcag aggtagcagt gggccaagat 21780

tgcgccactc cagcctgaac gacagagtga gactccacct cagttgaaaa acaaaaaaga 21840

aacctgcttt aaatatacca acatatgttg gttgaaatta aaagaataaa atatatcatg 21900

aaaacattaa tcaaaagaaa ggagtggcta tattaataac ataaaataga cttcagagaa 21960

aagaaaattt caagagacag gaataaaagg atcaagaaaa gatcctgaaa gaaaagcagg 22020

caaatcaatc attctgcttg gagattcaac accctctctt aacaactgat agaacaacta 22080

gacaaaaaaa tcagcatgga gttgagaaga acttaacacc actgaacaac aggatctaat 22140

agacatttac ggaacactct acccaacaat agcaaaataa acattctttt caagtattca 22200

ctgaacatat ccttagaccc taccctgggc cataaaacaa agctcactag tgattgccga 22260

aggcttggat ggacagtgga agagctgcat ggggagggag aaggtgacag ttaaagagtg 22320

taggatttct ttttgggata atgaaaatgt tccaaaattg attgtggtga tgttggcgca 22380

actctacaaa tataaaaaag gccattgaat tgtacgtttt aagtgggtga aacatatggt 22440

atgtggatta tatctaacgc ttttttaaaaa cttaacacat ttcaaagaat agaagtcata 22500

cagagtgtgc tctactggaa tcaaactaga aagaggtaac tggaggataa cgagaaaagc 22560

ctccaaatac ttgaaaactg gacagcacat ttctaaaatc atccgtgggt caaagatatt 22620

catttctgat attcattttt attgtttaat gtatttttaa aaatttctta agggaaataa 22680

actgactaaa aatgaatatg gctgggtgcg gtggctcacg cctgtgatcc cagcactttg 22740

ggaggccgag gctggtggat cacaagatca ggagttcgag accagcctgg ccaagatggt 22800

gaaaccccgt ctcaactaaa aaactacaaa aagtagccaa gcgcagtggc gggagcctgt 22860

ggtcccagct acttgggagg ctgaggtagg agaatcgctt gaacacaggc agcagaggtt 22920

gcagtgagcc aagattgtgc cactgcacgc cagcctgggc gacagagact gcctcaaaaa 22980

aaaaaaaaaa aaaaagaata tcaaaatttg tgggacatag ttaaagcaat gctgagaggg 23040

aaatttataa cactaaatgt ttacattaga aaagagaaaa agtttcaaat caatagtctc 23100

cactcccatc tcaagaacac agaagatgaa gagcaaaata aacccaaagc aagcaaaaga 23160

aagaaaatat aaaaataaat cagtaaaatt gaaaacagaa acacaataaa gaaaatcagt 23220

gaaacaaagt actgattctt cgaaagatta ataaaattga caaacctcta gcaaggctaa 23280

-continued

caaacaaaaa agaaagaaga cacggattac cagttattag aatgaaagca taattagaaa 23340

caactctaca cattataaat ttgacaatgt agatgaaatg gactaattac tgaaaaaaca 23400

caaattacca caactcaccc aatatgaaat agataattgg gatagcctga taactactga 23460

gaaaattgaa tttgtaattt taacactctt aaaacagaaa cattaaactt aatattttat 23520

aaatattaga taaggtaatt ataccttcc ttaacaaata aaaacgacaa attattttgc 23580

agctaaagag atgtatgtac tgtgaaaaat atcttcagaa aaatagaact ttgtttgaag 23640

aataaggatt taaaaaatgt ttttaactct caagaagcaa atatctgggc ccagatggtt 23700

tcactgaaga attctaccaa atgtttaatg aagaattacc accaactcta catagcatct 23760

ttgagaaaac tgaagagaag ggaacatctc ccagttcatt ttatgaagtg ggtgttactc 23820

tgatactaga actgtataag gacagctact cttgacacac tgcctatggg tagctctgct 23880

ctgcaggaac agtcagaaaa aaaaaaaaaa gaagcactgg acaagggcag tataaaaaaa 23940

gaaaactggg ccaggtgcag tggctcacac ctgtaatctc agcactttgg gaggctgacg 24000

ctggtggatc acctgaggtc aggagtttga gactagcctg gccaacatgg taaaaccctg 24060

tctctactaa aatacaaaaa ttagccaggc agggtggtgg ggaaaataaa aaggaaaaaa 24120

aaacaaaaat aaactgcaga ccaatatcct tcatgagtat agacacaaaa ctccttaaac 24180

tccttaacaa aatattagca agtagaagca atatataaaa ataattatac accatgatca 24240

agtgggactt attccagaaa cgcaagtctg gttcaacatt tgaaaacaag gtaacccact 24300

atatgaacgt actaaagagg aaaactacat aatcacatca atcaatgcag aaaaaagcat 24360

ttgccaaaat ccaatatcca ttcatgatac tctaataaga aaaataagaa taaaggggaa 24420

attccttgac ttgataaagc ttacaaaaga ctacaaaagc ttacagctaa cctatactta 24480

atggtgaaaa actaaatgct ttcccctacg atcaggaaca aagcaaggat gttcactctc 24540

attgctctta tttaacatag ccctgaagtt ctaacttgtg caaaacgata agaaagggaa 24600

atgaaagacc tgcagattgg caaagaagaa ataaaactgt tcctgtttgc agatgacatg 24660

attgtctcat agaaaatgta aagcaactag gggtaggggg gcagtggaga cacgctggtc 24720

aaaggatacc aaatttcagt taggaggagt aagttcaaga tacctattgc acaacatggt 24780

aactatactt aatatattgt attcttgaaa atactaaaag agtgggtgtt aagcgttctc 24840

accacaaaaa tgataactat gtgaagtaat gcatacgtta attagcacaa cgtatattac 24900

tccaaaacat catgttgtac atgataaata cacacaattt tatctgtcag tttaaaaaca 24960

catgattttg gccaggcaca gtggctcata cctgtaatcc cagcatttta ggaggctgag 25020

gcgagcagaa aacttgaggt cgggagtttg agaccagaat ggtcaacata gtgaaatccc 25080

gtctccacta ataatacaaa aattagcagg atgtggtggc gtgcacctgt agacccagct 25140

acttgggagg ctgaggcacg agaattgctt gaacaaggga ggcagaggtt gcagtgagct 25200

gggtgccact gcattccagc ctggtgacag agtgagactc catctcaaaa aaaataaaat 25260

aaagcatgac ttttcttaaa tgcaaagcag ccaagcgcag tggctcatgc ctgtaatccc 25320

accactttgg gaggccgagg caggcagatc acaaggtcag gagtttgaga ccagcctgac 25380

caacatggtg aaaccccatc tctactaaaa aatatataaa ttagccaggc atgtgtagtc 25440

tcagctactc aggaggctga ggcaggagaa tcacttgaac ccggaggcag aggttgcagt 25500

gttgagccac cgcactccag cctgggtgag agaacgagac tccgtctcaa aaaaaaaaag 25560

-continued

caaaataacc taattttaaa aacactaaaa ctactaagtg aattcagtaa gtctttagga 25620

ttcaggatat atgatgaaca tacaaaaatc aattgagctg gacaaaggag gattgtttta 25680

ggtcagtagt ttgaggctgt aatgcacaat gattgtgcct gtgaatagct gctgtgctcc 25740

agcctgagca gcataatgag accacatctc tatttaaaaa aaaaaaaatt gtatctctat 25800

gtactagcaa taagcacatg ggtactaaaa ttaaaaacat aataaatact gtttttaatt 25860

gcctgaaaaa aatgaaatac ttacatataa atctaacaaa atgtgcagga cttgtgtgct 25920

gaaaactaca aaacgctgat aaaagaaatc aaagaagact taaatagcgt gaaatatacc 25980

atgcttatag gttggaaaac ttaatatagt aaagatgcca attttatcca aattattaca 26040

caggataaca ttattactac caaaatccca gaaaaatttt acatagatat agacaagatc 26100

atacaaaaat gtatacggaa atatgcaaag gaactagagt agctaaaaca aatttgaaaa 26160

agaaaaataa agtgggaaga atcagtctat ccagtttcaa gacttacata gctacagtaa 26220

tcaagactgt gatattgaca gagggacagc tatagatcaa tgcaaccaaa tagagaacta 26280

agaaagaagc acacacaaat atgcccaaat gatttctgac aaaggtgtta aaacacttca 26340

acgggggaag atatgtctct cattaaaggg tgtagagtca ttgcacatct ataggcaaaa 26400

agatgaacct gaacctcaca ccctacagaa aaattaactc aaaatgactc aaggactaaa 26460

cataagatat acatctataa aacatttaga aaaaggccac gcacggtggc tcacgctcgt 26520

aatcccagca ctttgggagg ccaaggcagg tggatcacct aaggtcagga gtttgagacc 26580

agccggatca acatggagaa gccccatctc tactaaaaat acaaaattag ctggacgtgg 26640

tggcacatgc ctgtaatccc agctacttgg gaggctgagg catgagaatc gcttgaaccc 26700

gggggggcaga ggttgcggtg agccaagatc acaccattgc actccagcct gggcaacaag 26760

agcaaaactc caactcaaaa aaaaaaaaaa aaaggaaaaa tagaaaatct ttgggatgta 26820

aggcgaggta aagaattctt acacttgatg ccaaactaag atctataagg ccagtcgtgg 26880

tggctcatgc ctgtaattcc agcactttgg tcaactagat gaaaggtata tgggaattca 26940

ctgtattatt ctttcaactt ttctgtaggt ttgacatttt tttagtaaaa aattgggggga 27000

aagacctgac gcagtggctc acacctgtaa tcccagcact ttgggaggcc ggggcaggtg 27060

gatcacacgg tcaggagttc gagaccagcc tggccaacat ggtgaaaccc cgtctctacc 27120

aaaaatataa aaaattagcc gggtgtcatg gtgcatgcct gtaatcccag ctactgagga 27180

ggctgaggca ggagaatcac ttgaacctgg gaggtggaag ttgcagtgag ccgagattgt 27240

gccactgcac tccagccttg ggtgacagag cgagactccg tctcaaaaga aaaaaaaaaa 27300

aaagaatatc aaacgcttac tttagaaact atttaaagga gccagaattt aattgtatta 27360

gtatttagag caatttttat gctccatggc attgttaaat agagcaacca gctaacaatt 27420

agtggagttc aacagctgtt aaatttgcta actgtttagg aagagagccc tatcaatatc 27480

actgtcattt gaggctgaca ataagcacac ccaaagctgt acctccttga ggagcaacat 27540

aaggggttta accctgttag ggtgttaatg gtttggatat ggtttgtttg gccccaccga 27600

gtctcatgtt gaaatttgtt ccccagtact ggaggtgggg ccttattgga aggtgtctga 27660

gtcatggggg tggcatatcc ctcctgaatg gtttggtgcc attcttgcag gaatgagtga 27720

gttcttactc ttagttccca caacaactgg ttattaaaaa cagcctggca ctttccccca 27780

tctctcgctt cctctctcac catgtgatct cactggttcc ccttcccttt atgcaatgag 27840

-continued

tggaagcagc ctgaagccct cgccagaagc agatagtgat gccatgcttc ttgtacagcc 27900

tacaaaacca tgagcccaat aaacctttt tctttataaa ttatccagcc tcaggtattc 27960

ctttatagca agacaaatga accaagacag ggggaaatca acttcattaa aataatctat 28020

gcagtcacta aacaaataag aacaagaggc tccagaagtg ggaagccaat acccagagtt 28080

cctacaatac agtatctgaa aagtccagtt tccaaccaaa aaatatatat atacaggccg 28140

gacatggtag cttatgtctg taatcccagc actttgggat gctgaggcgg gcagatcacc 28200

ctaggtcagg agttcgagac cagcctggcc aatatggcaa aaccccgtct ctactaaaaa 28260

tacaaaaatt agccaggcat ggtggtggat gcctgtaatc ccagctactc gggaggctga 28320

ggcagggaat cacttgaacc caggaggcag aggttgcagt gagccgagat cacgccactg 28380

aactccagcc tgggcaacaa agtgagactc cacctcaaaa aaaaaaaaaa tatacatata 28440

tatatgtgtg tgtgtgtgtg tgcgcgcgtg tgtgtatata cacatacaca tatatacata 28500

tatacagaca cacatatata tatgaagcat gaaaagaaac aaggaagtat gaaccatact 28560

ttctgtggtt atgataggat ggggtatcac gggggaagta gacaagggaa actgcaagtg 28620

agagcaaaca gttatcagat ttaacagaaa aagactttgg agtaaccatt ataaatatgt 28680

ccacagaatt aaagaaaagc gtgattaaaa aaggaaagga aagtatcata acaatattac 28740

tccaaataga gaatatcaat aaaggcatag aaattataaa atataataca atggaaattc 28800

cggagttgaa aggtagaata actaaaattt aaaattcact agagaaggtt caacactata 28860

tttgaactgg cagaagaaaa atttagtgag acaaatatac ttcaatagac attattcaaa 28920

tgaaaaataa aaagaaaaaa gaatgaagaa aaataaacag aatctcagca aaatgtggca 28980

caccattaat cacattaaca tatgcatact gagagtaccg gaagcagatg agaaagagga 29040

agaaaaaata ttcaaatgat ggccagtaac ttcctagatt tttgttttaa agcaataacc 29100

tatacaatca agaaactcaa tgaattccaa gtaggataaa tacaaaaaga accacaaaca 29160

gatacaccat ggtaaaaatg ctgtaagtca aaaacagaga aaatattgaa agcagctaga 29220

ggaaaactta taagagaacc tcacttacaa aagaacatca cttataaaag aaccacaata 29280

atagaaacag ttgacctctc atcagaaaca atgaatgata acatatttga agtgctcaaa 29340

gaaaaaaaat aaagattcct atatacgaca aagctgtctt tcaaaaatat acatccaaaa 29400

ggattgaaac cagggtcttg aagagttatt tgtacatcca tgttcatagc agcattattc 29460

acaatagcca aaaggtagaa gcaacccaag ggtccatcga caaataaata aaatgtggta 29520

tatgtataca caatggaatt tattcagtat taaaaaggaa tgaaattctg acacatgcta 29580

caacatggct aaaccttgag aacactatgc taagtgaaat aagccagcca caaaaggaca 29640

aataccatat tacttcactt gtatgaaata cctagggtag tcaaattcag agatagaaag 29700

taaaacagtg gttgccaagg gctgagggag ggagtaacgt ggagttattg ttgaatgggt 29760

acagaatttc agttttgcaa gataaaaaga gttctggaga cagatggtgg tgagggtggt 29820

acaacaatac aaatatactt tatactactg aacagtatac ttaaaaatga ttaacatggt 29880

gaaaccccgt ctctactaaa aatacaaaaa aattagctgg gtgtggtggc gggcacctgt 29940

aatcccagct acttgggagg ctgaggcagc agaattgctt gaaaccagaa ggcggaggtt 30000

gcagtgagct gagattgcgc caccgcactc tagcctgggc aataagagca aaactccgtc 30060

tcaaaaaata aaaaataaaa aaaatttaaa aatgattaag caggaggcca ggcacggtgg 30120

-continued

ctcacaccta taatgccagc actttgggag gccgaggcag gcgatcactt gagaccagga 30180

gtttgagacc agcctggcca acatggcaaa accctgtctc tgctaaaaat acaaaaatta 30240

gccaggcatg gtggcatata cttataatcc cagctactgg tgagactgag acacgagaat 30300

tgcttgaacc caggaggcag agattgcagt gagtcgagat cgcgccactg aattccagcc 30360

tgggcgacag agcaagattc tgtctcgaaa aaacaaaaac aaaaacaaaa agcaaaacca 30420

aaaaataatt aagcaggaaa cgagattgct gctgaggagg agaaagatgt gcaggaccaa 30480

ggctcatgag agcacaaaac ttttcaaaaa atgtttaatg attaaaatgg taaatttttat 30540

atgtatctta ccacaaaaaa aagggctggg gggcaggaaa tgaaggtgaa ataaagacat 30600

cccagagaaa caaaagtaga gaatttgttg ccttagaaga aacaccacag gaagttcttc 30660

aggctgaaaa caagtgaccc cagagggtaa tctgaattct cacagaaaat tgaagcatag 30720

cagtaaaggt tattctgtaa ctatgacact aacaatgcat atttttttcct ttcttctctg 30780

aaatgattta aaaagcaatt gcataaaata ttatatataa agcctattgt tgaacctata 30840

acatatatag aaatatactt gtaatatatt tgcaaataac tgcacaaaag agagttggaa 30900

caaagctgtt actaggctaa agaaattact acagatagta aagtaatata acagggaact 30960

taaaaataaa attttaaaaa atttaaaaat aataattaca acaataatat ggttgggttt 31020

gtaatattaa tagacataat acaaaaatac cacaaaaagg gaagaagaca atagaactac 31080

ataggaataa cattttggta tctaactaga attaaattat aaatatgaag tatattctgg 31140

taagttaaga cacacatgtt aaaccctaga tactaaaaag taactcacat aaatacagta 31200

aaaaaataaa taaaataatt aaaatgtttg tattagtttc ctcagggtac agtaacaaac 31260

taccacaaat tgagtggctt aacacaactt aaatgtattt tctcccagtt ctggaggcta 31320

aacacctgca atcaaggtga gtacagggcc atgctccctg tgaaggctct aggaaagaat 31380

cctcccttgt ctcttccagc ttccagtggt tctcagtaac cctaagtgct ccttggcttg 31440

tagctatatc attcctagca accagaaaga agaaaataat aaagattatg gcaaaaaata 31500

atgaaatcaa aaggagaaaa atggaaaaaa ataaataaaa ccaaaagcta gttctttgaa 31560

aagatcaacc aagttaacaa acctttaac tagactgaca aaaaggaggt aagactcaaa 31620

ttactagaat cagaaataaa agaggggaca ttactaatga gggattagaa aagaatacta 31680

cgaacaaatg tgtgccaaca aattagaaaa cttagatgaa atggacaggt tcctaggaca 31740

acatcaacta ccaaaattta ctcaagaaga aagagacaat ttgaatgagc tataacaagg 31800

gaagagactg aattgacaac caagaaacta tccacaaaga aaatcccagg cccagaagat 31860

ttcactgtga aattctttca aacttataaa tataaattaa catcagttct tcacaaactc 31920

ctccaaaaaa aagaacagat ctctatttac aggcgatacg atctttagaa aatcctaagg 31980

gaactactaa gacactatga taactgataa acaagttcag caaggctgca ggatagaaaa 32040

ccaatataca aaaatctatt atatttctat acacttgcag tgaacaaccc aaaaatgaga 32100

ttaagaaaat aattcaattt acaataacat caaaaagaat aaaaacactc aaaaataaat 32160

ttattcaagt aagtgcaaaa cttatactct agaagctaca aaacactgtt aaaagaaatt 32220

aaaggtttac ataaatgaaa aactatccca tgttcatgga tcaaaagact tattactggc 32280

aatgctctcc aaattgatct ataaattcaa caaaatcctt atcaaaatcc cagatgaggc 32340

tgggggtggc ggttcatgcc tgtaatccca gcactttggg aggctgaggc acgcagatta 32400

-continued

```
cctgaggtcg ggagctcgag atcagcctga ccaacatgga gaaaccctat ctcttctaaa  32460
aatacaaaat tagtcaggcg tggtggcaca tgcctataat cccagctact cgggaagctg  32520
aggcaggaga atcgcttgaa cccaggaggc agaggttgca gtgagccaag atcgtgccat  32580
tgcactccag cctgggcaac aagagcaaaa ttccatctca aaaaaaaaaa aaaaaaaatc  32640
ccagatgact tcactgttga aattgaaaag attattctaa aattcacatg gaattgcaag  32700
accttgagaa tagccaaaac aaacttgaaa aacacgaaca aaatatagga tgactcactt  32760
gccaattgca aatgttacga cacagcaaca gtaatcaaga ctgtgtggta ctggcaaaag  32820
acacatacat acatacatat caatggaata taattgagag tacagaaaca agcctaaaca  32880
tctatggtaa gtgcttttct atttttttct ttttttttt ctttttgta gagatagaat  32940
ctcaccatgt tgcccaggct ggtcttcaac ttctgggctc aagcaatcct cccactgtgg  33000
cctcccaaag tgctgggata actggcatga gccaccacat ccagcccaga tgattttcaa  33060
aaaagtcaac aagaccattc ttttcaacaa ataggtctgg gatgatcaga tagtcacatg  33120
aaaaaaaaaa tgaagttgga ccctccatca cactaaagtg ctgcgattat aggcatcagc  33180
caccacatcc agcccaaatg attttcaaaa aggtcaacaa gaccattctt ttcaacaaat  33240
aggtctggga taatcagata gtcacatgaa aaaaaaaatg aagttggacc ctccatcaca  33300
ccatatgcaa aaattaattc aaaaatgaat tgatgactta aacgtaagag ttacgactgt  33360
aaaactctta gaaggaaaca tacgggtaaa tcttaaagac gttaggtttg acaaagaatt  33420
cttagacatg acaccaaaag catgaccaac taaggtaaaa tagggtaaat tgtacctacc  33480
aaaatgaaaa acctttgtgc tggaaaggac accatcaaga aatggaaagc caaaatagcc  33540
aaggcaatat taagcaaaaa gaacaaagct ggaggcatca tactacctga cttcaaagca  33600
acagtaacca aaacagcatg gtactagtag aaaaacagac acatagacca atggaacaga  33660
ataaagaacc caaaaataaa tccacatatt tatagtcaac tgatttttga caatgacacc  33720
ccttcaataa atgatactag gaaaactgga tatcgatatg cagaagaata aaactagacc  33780
cctatctctc accatataga aaaatcaact cagactgaat taaagacttg aatgtaagac  33840
ccaaaactat aaaactactg gtagaaaaca taaggaaaaa cgcttcagga cattggtcca  33900
ggcaaagatc ttatggctaa aacctcaaaa acacaggcaa caaaaacaaa aatggaaaaa  33960
tagcacttta ttaaactaaa aagctcctgc acagcaaagg aaacaacaga atgaaaagac  34020
aacctgtaga atgggagaaa atatttgcaa actatccatc catcaaggga ctagtatcca  34080
gaacacacaa gtgactaaaa caactcaaca gcaaaaaagc aaataatctg gtttttatat  34140
gggcaaaaga tctgaataaa cattctcaaa ggaagacata caaatgtcac tatcattctg  34200
ccagtaccac actgtcttga ttacttgtta gtgtataaat ttttaaattg ggaagtgtga  34260
gtcatcctac actttgttct tgtttttcaa gtttgttttg gctattctgg gagccttgca  34320
agtataaaat agccaacaag tatgaaaaaa tgctcaccat cactaatcat cagagaaata  34380
aaaatcaaga ccactatgag atatcctctc actccagtta gaatggctac tatcaaaaag  34440
acaaaatata atggatgctg gcaaagattt ggagaaaggg gaactcctat acactgtggg  34500
tagggatgca aattggtaat ggccattatg gaaaataata ctgaggtttt tcaaaaaact  34560
gaaaatagaa ctaccatatg atccagcaac cctactactg ggtatttatc caaaggaaag  34620
aagtcagtat actgaagaaa tatatgcact ctcatgttaa ttgcaacact gttcacaaca  34680
```

-continued

gccaagacag ggaataaatc taaatgtgca tcaacagatg aatggataaa gaaaatgtgg 34740

catatacact caatagaata ctattcagcc attaaagaag aatgaaatcc tgtcatccca 34800

gcaacatgga tgaacctgga ggacattata tttaatgaaa taagtaaagc acaaaaagat 34860

aaacagtaca tgttctcact cagacatggg tgctaaaaag aaaatggggt cacagaatta 34920

gaaggggagg cttgggaaaa gttaatggat aaaaatttac agctatgtaa gaagaataag 34980

ttttagtgtt ctatagaact gtagggcgag tatagttacc aataacttat tgtacatgtt 35040

caaaaagcta gaagagattt tggatgttcc cagcacaaag gaatgataaa tgtttgtgat 35100

gatggatatc ctaattaccc tgattcaatc attacacatt gcatacatgt atcaaattat 35160

cactctgtac ctcataaata tgtataatta ttacgtcaac aaaaaaagga aaaaaaagaa 35220

aattaagaca acccacataa tggaagaaat aaaatatctg caaattatat atatctgata 35280

aatatttaat atttataata tataaagaac tcctacaact caagaacaac aacaaaacaa 35340

cccaattcaa aaatgggtaa aagccttgaa tatacactta tctaaagact atatacaatt 35400

ggccaataaa gacacgaaaa gatgctcaac atcactagtc atcagggaaa tataaatcaa 35460

aaccacaatg tagaatgtag acaccacttc atatgcacta ggatggctag aataaaaagg 35520

taataacaaa tgttggtaag gatgtgaaaa aatcagaaac ctcattcgct gctgttggga 35580

atgtaaagtg atgcagccac tttggaaaac agtctggcag ctcctcaaat tattaaatac 35640

agagttaccg tatgacccag gaatattcct cctgggtcta taaccaaaaa aatgaaaaca 35700

tatatccaca taaaaacttg tacatgggca tttatagcaa cattattcat aacagcaaag 35760

gtggtaagaa cccatatgcc catcatctga tgaacaggta aataacatgc ggtattatcc 35820

atacactaga atattatctg cccatacaag gagtgacatc cagctacatg ctacaaggat 35880

gaatctcgga aaccttatgc taagtgaaag aagccagtca caaatgacca cagattatga 35940

ttccatgcat cggaaatgac cagaataggg aaatctatag agacagaaag tagattagtg 36000

gttgggtggg gctgggagga caggtagtac actactttcc cagaactact ggaacaaagt 36060

accacaaact ggggagctta aacatagaaa ttgatttcct cacagttctg gagactagga 36120

ctctgagatc aaggtgtcag cagagctggt tctttctgag ggccctgagg caaggctctg 36180

tcccaggcct ctctccttgg ctggcaggtg gccatcttct ccctgcgtct tcacatcatc 36240

ttttctctgt gtgtgcccat gtccaaattt tgattggctc attctgggtc atggccaatt 36300

gctatgcaca aagtgaagtc tacttccaaa agaagggaag agggaacact gactaggcta 36360

aacttatagt cattttaatg tccgcttttc ctatgagatt gtgaacacac agaagtaggg 36420

tttttatcta cattgtgcaa agtttaataa gaaaaataga attcaagaga agcagttcaa 36480

tagcaggaat ttaatatggg aactaattac aaggtttagg gcaggactaa aaagccagtt 36540

gggatggtga gccaacccag agattagcaa cagtgggacc ccatctacct accacccatg 36600

aagctggaag gataaaggag gggctattat cagagtccac aagccagtgt cagagtcctt 36660

ggctggagct gggaccaccc tagagacact gtgcaaagca gaaaacaagg gggaaaaacc 36720

ctgacttctc ccttcctccc acctttcaat ctcccactag tgcttcctac tagccatact 36780

tggccagaga cagtgacaag gaacactgca aaatgaagtt tgtaggaatc atctccctct 36840

gagacagaga aatatggaag ggtagaaaat gaatcagagg ataaagagaa aaaaccctga 36900

gtactatctt atttatcttt gtatctccag tgcctaatct gtctctcaaa aaaggaaagc 36960

-continued

aattgagaga aactgaaaac tccaattgaa atgaaagaat ggagaattac tggactagaa 37020

gagaagagaa aaatttattc cgcatagagt aaacaagaat ggattcacaa aggacgtgat 37080

gaatgaaaag ctataatcag caaagatttg ccagagaaat taaaaagtgg taaactcagc 37140

cacgctgtac aacctgaagg cacaatgcat gaaaacgttt caagaaatga caagatttga 37200

agtcaaattc taagtgcttt tccagaatct ctcaagacga ttatatagct accccatttt 37260

attaaataaa atggaaactt actaaacttt ccccttgtat taaactaaca tatgtcctaa 37320

tagcaaacga ttctggaatt cctagagtaa aatatatttc gtcaaagtgt attgctcttt 37380

taatattctg ctgacctcct tttgctattt aggatatttg tatacacatc acacgtaaat 37440

ttggtctata gtttacatct acgggcttat actgttcttt ttttcatttt tttaaaattt 37500

ccaaccccca gtatccatat actgctctct atcagggtta ttttaacttt gtaaaatcag 37560

ctgagatgct ttccatgttt tttttttta ttttctgcca catttgaata gcataggagt 37620

taccaccatc aaccttggat tatttaagca ttcacgattc cacgtgtgga ttttttattc 37680

agagtctttc ttgtcattcc tgctatcagc acagaaccca atctcagctt tccagctata 37740

ctctcacccc atggaatttg cagatgaagt tcaaaaggac ctttgcatta tcctgcctcg 37800

ccctcttccc ccttcattta gacatcacct tcttctagaa cgtcttacct gacatgccct 37860

gctcccaacc cctgctgccc aattgtgtgc tctcccgtgt cctggcctgc catcctcttt 37920

agtaattgcc tgctccctca tctgtctccc cacccagaca ttaagctgaa tagactggat 37980

ttgtgtcttg tccatcacta taatctcagc acctagtacc tagtaggtac ttaccatgta 38040

ttcattagca aaatgttatg tataaccttg caccttaaaa acaagagaag gaagacaaaa 38100

ttaagtctta agactatggt ttagaacatg gatcagaaac tacagtctgc agcccaaatc 38160

cagaccaaat gaagagacca tgttcattta catacaacct atagcagctt tcacactaca 38220

ggagcagagc taagtagttc caagggaaca cacggccctg caaagcctaa aatatttact 38280

ctatagctct tcacagaaaa agttttcaga tccctcgttt agaactcttg ttcatatgca 38340

atttcactaa accatagttt tttgggtttg tttggttttt tttggcaaaa aggaatgagc 38400

cgatccagaa aaggttgaaa agaatgaatc attactgctg aaagaatgtg cacacagtcc 38460

gtcagtattc tgctgccatg ctgacaccca tccaatagtg tcatgagatg cagcagctac 38520

tactgtgttc tcaatgccga gtccacccac tccataacca tgtccaagca atcttgggaa 38580

catcatcacc atgcttgttt atccttaagg tattgcctca catacagcag tggctggtca 38640

taaagtcaaa tgacactagt ggccaggagg tcaagagaat gagtgaggac aggtgggtag 38700

gcagcccagg ccctagcaac agcaggagct caccctcag tcactctagc caggactgaa 38760

atacttttca ccctttcaag agagactagg aatctggatt tttatgtgaa atatcttgat 38820

tactaaatgt tgtcaacaga catgtcaaaa ggtaaaacta agtaagttca tggggcagat 38880

tgactattca ggttatagaa ttaaggattc ttatccaaca cagataccaa ccaaaaagct 38940

gacgtataac atattaggag aaactatgtg cactgtcgaa acatcaacaa ggggctaatg 39000

tctaaaatag tctatattgg attccagttg aaacatgggg aaaggacatg aacaggcaac 39060

ttatgtcaat ggaaactcaa aaagataaca agcatatata aaagcattct caaattcagt 39120

agtaaacaga cagatgcaaa taaaaagagg gaaactgctg ccgggcacag tggctcacac 39180

ctgtaatccc agcactttgg gaggccgagg cgggcggatc atgaagtcag gagatcgaga 39240

-continued

```
ccatcctggc taacatggtg aaaccccgtc tctactgaaa acacaaaaaa ttagccaggc  39300
gtagtggtgg gcaccagtag tcccagctac tcaggaggtt gaggcaggag aatggcatga  39360
acccaggagg cggagattgc agtgagccga gaccatgcca ctgcactcca gcctgggcga  39420
ctgagtgaaa ctccatctca aaaaatataa taataattat aattataata ataataaata  39480
gtaaataaat aaaaagagag agactgctaa agtctagaaa gttgaatgat gccaagcgca  39540
tgcaaagatc agggccttgg gatggccggg tgcagtggct cacgcctgta atcccaccac  39600
tttgggaggc caaggcgggc ggatcatgag gtcaagagat caagaccatc ctggccgaca  39660
cagtgaaacc cggtctctac taaaagtaca aaaaaatata tatatatata tatattatta  39720
tattatatat atatatatca gagccttggg aatccttgtg tgctgctggg gaaggtagtg  39780
gtgcagccac ccttgacagc aatctggcag tacttggtta tattaagtat aggcacacac  39840
cacgaccagg cagtcctact cctgggtcta aatcccaaag aattctcaca caagtccata  39900
aggagacatg tacgaggctc attcagcatt actgggagtg ggaatcaacc tgggtgtcca  39960
tctacaggag acgagatgga caaaatgtgg tggatattaa gaccagaatc accaagtaac  40020
agagatgggt ggtgagtgac aatcctaaga tacagaataa aggctagaac atgatgccat  40080
tcatgtaaat taaaaataga tgcacacaaa gcagtatacg cgtgaccctt gaatagcaca  40140
ggtttgaact gcctgtgtcc acttacatgt ggattttctt ccacttctgc tacccccaag  40200
acagcaagac caacccctct tcttcctcct ccccctcagc ctactcaaca tgaagatgac  40260
aaggatgaag acttttatga taatccaatt ccaaggaact aatgaaaagt atattttctc  40320
ttccttatga ttttctttat ctctagctta cattattcta agaatatggt acataataca  40380
catcacacgc aaaataaatg ttaattgact gtttatatta tgggtaaggc ttccactcaa  40440
cagtaggctg tcagtagtta agttttggga gtcaaaagtt atacacagat tttcaactgt  40500
gcaggcaatc agttcccctg acccccctcat tgttcacggg tcaactgtat atacacaaaa  40560
gtattatatg aacctcatta gaatagctgt ctatagggag aagagaatga gagtgggata  40620
aaacggaatg aacaaataaa ccaacaaatg cattaacaag caaaacaaca gaggggcttg  40680
catgggccag tgatgataaa gggctaagaa tgagaatata attaattcaa ttcctcacac  40740
ctgaggtcta aaaccaagga aagggagggc caggcgtgga ggctcacgcc tgtaatccca  40800
gcactttggg aggctgaggc gggcggatca caagattagg agtttgagat cagcctggcc  40860
aacacagtga aagcccatct ctacaaaaaa tacaagaatt acccaggtgt ggtggcacat  40920
gcctgtagtt agctactctg gaggctgagg caggagaatc acttgaaccc aggaggcgga  40980
ggttgcaggg agccgagatc acaccattgc actccagcct gggtgacaga gtaagactct  41040
gtctcaaaaa aataaaaaaa ataaaaaaac agagaaaggg aggaaactag atccaggctg  41100
actagataca gcctttagag ttagaaaaga tgatttgaca atctaagccc acactcagat  41160
tgaatgaaat tgaaaagcct ttcaaactaa aacatttaat tacaccatct gctgcagaca  41220
gaactcagac aactcaaaca ggtaatgtca gcgtggtgtt ttatatcacc accctcaaca  41280
cagaataaaa atcagctgca tgtgaagcag tgactagaat gaagaaaagg ctgcttctta  41340
cttccttcta gtggttcttt ccgaaaacat taataggcac cagctctatg catgtcaccc  41400
tgcagggaga catggggtat ataactatga cttactgttc attcctcaag gaattcccaa  41460
tcttgtggaa gattatacac aatgaggcaa caaaaactat ccaataaaac cacggaaaag  41520
```

-continued

aagccagtga caaagaagcc agtgatgaaa ggccctgtga gcagagctga tggccatttg 41580

gggaagaaag accaacatgg atgggggtga tcagggtggc tccgtgggaa agctggaaga 41640

gaagtggcag atctctgagc tggatgatgg gccactacca tctgtatatg gctaattaaa 41700

gaccatgtgt ggatttttta ttcagctctt tcgtgtcatt cctgctatca gcacagaacc 41760

caatctcaac tttccagcta tattgagcta aacttctcac ctcatggaat ttgcagataa 41820

agttcaaaag gatccttgcc ttttcaaaat aattttgaat ggttgagtag tccctctgtg 41880

ctctctcact gacaccctct caaggctgct gagcacgtgc catgctatgg ctttctccaa 41940

catcaggaaa tgttctccac tcagtttcac cttaatacaa atgtgttctc tcttcagaga 42000

aggcaaaaaa attcatgacc atctgactgg gagaagtcat ttctaggtaa agtgtccatc 42060

tttttctgag gaacacagga ggaaaatctt acagaaaaga gttaacacag caggcctaag 42120

actgcttttt aaaataaata aataaataaa taaataaata aataaataaa taaataaata 42180

aataaatgaa tgatagggtc ttctgtattg gccaggctag tctcaaattc ctggcttcaa 42240

gagatcctcc caccttggtc tcccacagtg ttgggattat agacatgagc cattgtgctt 42300

ggcccaagac tgttattctt aaaaagtctc ataaaaagca tggttaatcc ttggctggca 42360

cctgggaact tagatttcag aagggttccc accatccaac ctggaaagag ggactcactg 42420

tgcctaaatt attgtgtggt ttatgctgaa ctcctgcttt tcttcaggta gcgtggaatg 42480

tggtatgtgc tgggcaaagg gggcctgcat gaccagcccc caataaaaac cctgggtgtt 42540

gggtctctag tgagtttccc tggtagacag catttcacat gcgttgtcac agctccttcc 42600

tcggggagtt aagcacatac atcctgtgtg actgcactgg gagaggatgc ttggaagctt 42660

gtgcctggct tcctttggac ttggccccat gcacctttcc ctttgctgat tgtgctttgt 42720

atcctttcac tgtaataaat tacagccgtg agtacaccac atgctgagtc ttccaagtga 42780

accaccagat ctgagcatgg tcctgggggc ccccaacaca gaaataaatt ataaaagacc 42840

aaggactggg catggtggcc catgccggta atctcagcgc tttgggaggc cgaggcagga 42900

ggaccagtta agcccaaaag ttcaaagtta cagtgaccta tgactgcgcc aatgcactct 42960

aacctgggag acagagcaag accctgtccc caaaacaata aactaaacac atacttctgc 43020

cttccaagtg tcttaaaatt caatggaatg gtagaaacat ttttaaaaca ctaaatcaaa 43080

agaaacctgg aaaacaagag tgccgatggc caactaaaat gtctaggaaa tttctgaaaa 43140

gtaaaaagta ctcagaacca gattacctga gcaaaccata gcccaataca agcttgggag 43200

gaggctgtta tgcagaagga aatggtaaca ggtttccagg aacagacttg taacagcaga 43260

tagaacagca gaggtagaac ctgacaaggt gattacctgg ggaactgcag tctgaatgac 43320

caggactgtt ggacccttcc cctcacatgg aatacacacg ccactcagca gcacaccaca 43380

gctcttcaac aatcacagga ggcacgctac gcctagtaag acaggaaaaa aggaattctc 43440

aaacttcgaa gatgaacaca taaagaatca ccaagttttt attcagtatg atgaaacagg 43500

gacactgaat caacagaaca caaacccaag caaagataat tactagagca catagaagaa 43560

attattagat attcttggga agacctaagg ggacattata aagagcaagc agttggtatg 43620

tgacgatctt tgtgatatac caagaaataa aaacacagga tgaagaccag atagagaata 43680

atgctactat ttgtgcaaaa aaggagaaat ggagaatctg attcatattt gcttgtattt 43740

gcatgaagaa actttggaag gtacataagt aactaacaac aatggttacc tacttgtaag 43800

-continued

gcgagagaag taagaggaca ggaatggtgg gaacaccttt tgtgtccgga attggtgggt 43860

tcttggtctg acttggagaa tgaagccgtg gaccctcgcg gtgagcgtaa cagttcttaa 43920

aggcggtgtg tctggagttt gttccttctg atgtttggat gtgttcggag tttcttcctt 43980

ctggtgggtt cgtagtctcg ctgactcagg agtgaagctg cagaccttcg cggcgagtgt 44040

tacagctctt aaggggggcgc atctagagtt gttcgttcct cctggtgagt tcgtggtctc 44100

gctagcttca ggagtgaagc tgcagacctt cgaggtgtgt gttgcagctc atatagacag 44160

tgcagaccca aagagtgagc agtaataaga acgcattcca aacatcaaaa ggacaaacct 44220

tcagcagcgc ggaatgcgac cgcagcacgt taccactctt ggctcgggca gcctgctttt 44280

attctcttat ctggccacac ccatatcctg ctgattggtc cattttacag agagccgact 44340

gctccatttt acagagaacc gattggtcca tttttcagag agctgattgg tccattttga 44400

cagagtgctg attggtgcgt ttacaatccc tgagctagac acagggtgct gactggtgta 44460

tttacaatcc cttagctaga cataaaggtt ctcaagtccc caccagactc aggagcccag 44520

ctggcttcac ccagtggatc cggcatcagt gccacaggtg gagctgcctg ccagtcccgc 44580

gccctgcgcc cgcactcctc agccctctgg tggtcgatgg gactgggcgc cgtggagcag 44640

ggggtggtgc tgtcagggag gctcgggccg cacaggagcc caggaggtgg gggtggctca 44700

ggcatggcgg gccgcaggtc atgagcgctg ccccgcaggg aggcagctaa ggcccagcga 44760

gaaatcgggc acagcagctg ctggcccagg tgctaagccc ctcactgcct ggggccgttg 44820

gggccggctg gccggccgct cccagtgcgg ggcccgccaa gcccacgccc accgggaact 44880

cacgctggcc cgcaagcacc gcgtacagcc ccggttcccg cccgcgcctc tccctccaca 44940

cctccctgca aagctgaggg agctggctcc agccttggcc agcccagaaa ggggctccca 45000

cagtgcagcg gtgggctgaa gggctcctca agcgcggcca gagtgggcac taaggctgag 45060

gaggcaccga gagcgagcga ggactgccag cacgctgtca cctctcactt tcatttatgc 45120

ctttttaata cagtctggtt ttgaacactg attatcttac ctatttttt ttttttttt 45180

tgagatggag tcgctctctg tcgcccagac tggagtgcag tggtgccatc ctggctcact 45240

gcaagctccg cctcccgggt tcacaccatt ctcctgcctc aacctcctga gtagctggga 45300

ctacaggcaa tcgccaccac gcccagctaa ttttttattt tatttttttt ttagtagaag 45360

cggagtttca ccatgttagc cagatggtct caatctcctg acctcgtgat ccatccgcct 45420

cggcctccca aagtgctggg attacagacg tgagccactg cgccctgcct atcttaccta 45480

tttcaaaagt taaactttaa gaagtagaaa cccgtggcca ggcgtggtgg ctcacgcctg 45540

taaccccagc actttgggag gccgaggcgg gcggatcacg aggtcaggag atcgagatca 45600

tcctggttaa cacagtgaaa ccccgtcgct actaaaaata caaaaaatta gccgggcgtg 45660

gtggtgggca ccggcagtcc tcgctactgg ggaggctgag gcaggagaat ggcgtgaacc 45720

tgggaggcag agcttgcagt gagccgagat agtgccattg ccttccagcc tgggcgacag 45780

agcgagactc cacctcaaaa aaaaaaaaaa aaaatagaga cccggaaagt taaaaatatg 45840

ataatcaata tttaaaaaca ctcaagagat gggctaaaga gttgacggaa caaatctaaa 45900

tattagattg gtgacctgca aaaccagccc aaggaacatc ccagaatgca gcccataaag 45960

ataaagagag catttccgct gggcacagtg gtatggcagg ggaattgcct gagtccaaga 46020

gttgcaggtc acattgaacc acaccattgc actccaggcc tgggcaacac agcaatactc 46080

-continued

tgtctcaaaa aaaaaaaaaa ttaaattaaa aaagacagaa tatttgagag aaaaaaatgc 46140

ttatttcaag aaacatgaaa gataaatcaa gatattctaa ttcccaagta agaataattc 46200

cagaagcaga aaatagaata gaggcaagga aacactcaaa acttctccag tgccatagaa 46260

atgtgtatta atctttagaa tgaaacggac taccaaatgc tgagcaggaa gaacaaaaga 46320

gatccactct taagccagtg tggtgcccaa gcgcagtggc tcatgcctgt aatcccagca 46380

ctttgggagg ccgaggcagg tggatcacct gaggtcagga gtttgagatc agtcaggcca 46440

acatggtgaa accctgtctg tactaaaaat acaaacatta gctgggtatg gtggtgcaca 46500

tctgtaatcc caactacttg ggaggctaag gcaggagaat cacttgaaac caggaggtgg 46560

aggttgtagt gagccgagat catgccacac tcccagcctg ggtgacagag caagattcca 46620

tctcaaaaaa aaaatccact cctagacaaa taatagttaa attttagaac accaaggaga 46680

aagaaaaaaa attgtaaagc ttcagagaaa ataaacatta actacaaaga aacgagagtc 46740

agacgcgtgc acttcttcct agataccagc agataaagca atatctccaa aattcagaag 46800

gttttaacgt agaatcctat acccagtcaa gaatattcac atggaaaagt gaaataaaaa 46860

acattgttta aacatgcaag ggttcagaaa gtttaccatt cacagaatcc ctgaaaacaa 46920

aaccaaataa tcacttaagg actcattaag aaaacaaatg aaataaaagc accaatgatg 46980

agtaaataat cagaaaaatt tacagtttac ctaaataact gtttatgcat aatgtatgaa 47040

aacccaaaaa tttaatatgg gacagaatta aaatcatgat aagattcttt tttgctttac 47100

tcatggagag ttcacataaa cagattatct tttaatagca agagaaaaaa atgtttagat 47160

atgtgtgaaa aactaagggt accaaaacag tgcaaattca tttatcatca ggaaaatcca 47220

aattaaaacc acagtatcca ccagaataac taaaaggtaa aagacagaaa ttaccaagag 47280

ttggcaagaa tgtggagcaa ccacatatac ttctggggta aataagttgg tgcaaccggt 47340

actgaaaact gtttgctagt atctactaaa accgagcaca tgcacagact acaaccaagc 47400

agttccactc ccagatacac actcaacaga aatgcacaca ctcactcaac aaaagacgtg 47460

tactagagtg ttcatgtact tactattcat aatagtccaa aaatgcaaac aaccaactgc 47520

caatcaaagt caaatgtata tctatattag ggatatatac aatggcatat acacagcaat 47580

gagaatgaaa tgaaccagct cggcacagtg gttcatgcct gtaatctcag cactttgggc 47640

gggtaaggca ggcagatcac ttgaggtcag aaatttgaga ctagcctggc caacacggtt 47700

aaaacctgtc cccactaaaa acacaaaaat tagccgggca tagtggttgc aggcctgtaa 47760

ttccagctac tcgggaggct gggttgggag aatcgtttga acccgaaagc cggaggtcgc 47820

agtgagcgga gatcgtgcca ctgcactcca gcctggacga tagagcaaga ctccgtctca 47880

aaaaaggaaa tcaaaaatat aaaataagat gacaggaata atccgcaaaa gatcagtaat 47940

caaaataaat ataaatgggc taaagctacc tattaaaaga caaagatttc acacccataa 48000

ggatagctac tatcaaaaaa agagagagaa taacagatgt tagcaaggat gtatggaaac 48060

tgaaattctc acgcattgct ggtgagaata taaaatggtt cagcctctgc ggaaaacact 48120

atgctgggtc atcaaaaaat taaaaataga agtactactt gatccaacaa ttctacttct 48180

gggtatatac ccaaataact gaaagcaggg tcttgaagag atatttgtac acccatgatc 48240

atggcagcat tattcataat agctatgatg tggaaccaac ataaatatcc tttgataaat 48300

atatggataa gcaaaatgtg gtgtatacat tcaatggaat attaattagc aataaaaatg 48360

-continued

aagaaaattc tgacacatgc tacaacatgg atgaaccttg agggcattac attaaatgaa 48420

ataagccagt tataaaaaga caaatactat atgaggtact atattagata ctcatgcaag 48480

gtacctaaaa taggcaaatt catagagaca aaaagcagaa tggtggttgc caggggctgc 48540

ggtaatggat acagagcttc aattttgtaa gatgaaaaaa ttctggagat tggttgcata 48600

acaatgtgca cacacttaac actggggaac tgtaaactta aaagtagtaa atggtaaaaa 48660

taaaaataat aaataataaa ttttatgtta ttttaccaca atatttatta aaagacaaag 48720

attaactaat taaacaaaat ccagccataa gctaatggta agagtaacaa ttaaagaaga 48780

cacagaaaat tgaaaatcag tgactagaaa aagatattcc atataaatgc taacaaaaag 48840

caagtacagc aatataaaga gaatgaacaa aaaaaaaatt aaataagatg gctcgtttat 48900

tcccaaaagg tacaattcac caagaagata caagaattgt gaacctttaa gcacataaaa 48960

cagcttcaaa aatacaacat ttaaagaaaa atatatatta aacatagaaa tagtacaaaa 49020

acccctacaa gaatcataat gggagtcttc aatacaactc tccatatcaa caggtcaaac 49080

agagaaaaaa aataagttaa ggatgcagaa aacctgaatt accatcaata aacttgagat 49140

taatatagaa ctgtataccc aatatactaa gagttcaggg aacagtcgtg actgacagtg 49200

gactgcaaat taatctgttc ttaatctttg tttttctttc agcactgtgg cagaatagag 49260

atcctaaaaa ccttccagct acaaaacatc tttttaaaaa tataaaaaaa tacaaaaata 49320

actctgaaat caatagaaga cacatggtga aaccaaaatt ctagaataca gggagaataa 49380

aggcatttтc agatattaca aaaacagaaa attgatcatt gctgaagtaa tttctaaaga 49440

atgtacttga gggagaagaa aaatgttcca aagaaaagta tctgtgatac aagaaggaat 49500

ggaaagtgaa gaaatggtaa acaggtagat aaagctaata aatgttgacc tagaaaataa 49560

caaaaacaat agcaataatg tctcgttgga agggttgaag taaaaataca attaaggcca 49620

aatgtgaggt aagtggaatg aaagaattag aagtccttgc cttgttcaca ggactgatta 49680

aataaatgag ccaggttttc cattcaaaca gttaaaactt gaacaaaata aactcaaatt 49740

aagtagaaag ataaaaaaca gaaattaatg tcatagaaaa ataaaaaatc aatagaatta 49800

atcaataaat cctggttaat aaaagctggt tctttgaaag gattaataaa ataatcatta 49860

agcaagtctg atcaaaaaaa aagagaaaag gtaccaaaaa aagtactgta tcagaaagag 49920

aacatacaga tacatacaga tatgtaagag tctgttttct tacaccagaa tactatatac 49980

aacattatgc tagcatatat taaatttcaa taatgttaat gattttctag gaaaacagaa 50040

aatattaaat ttactttgaa gaaacagaaa aactgagaaa aataaatgat catgaaaaaa 50100

atgaaaaggt aattaaatac tgatattaac tgcctaaaca acaccagcag cagcccaggc 50160

agtctgcagt caagttctgc caaacttgag ggaacagata attcttctat tccagagcat 50220

agaaaatgat ggaaagtttc ccaatttaat cagagaggac agcctgatcc ttgttatgaa 50280

cacagataaa aatggggtaa actatatgcc aaactcagat accaaaaccc taaataagat 50340

gctagcttat tgatgtgaac aatccaaaag tgcattttaa attagcccag ggttttagag 50400

aaagaaaatc tagcaatgtg accaccactt atgttaacaa ttttaagacg aaaatctaca 50460

tgatcatatc aatgcatgct acacaaaagc atttgggcaa aaaacccaac acccaccctt 50520

gacttttttaa actcttagta attaggcata aacagaaatg tacttaatgt gatagaatac 50580

actcggtgaa gatacagagg gaatgctccc taaaaccaag cccaagacaa agattcctat 50640

-continued

ttaacctcaa tagtcaacac tgcagcgaga gtaatctatg gaagacaagg aaaaaagtaa 50700

aaacatgaga gacatctgtt gtttaacaga caataagatc acctacttgg aagaggcaaa 50760

cgaatcaagc gaaaaactat taaaactgag acaggcttta gtatggaggc tcagcttcag 50820

ctgtagtttg ggctaccaaa ttcaactcgc ttgcttggag agttaatcct gcaaagctaa 50880

tttctgttga ggtattagga ttgacaagcc tgtgctcctc cctcctcccc catcttcaac 50940

actgaaataa cacggtgttt ggaactggat aacagaatct tccaaaaaca aaaattgtcc 51000

tgaagggctg acttgtgccc ttactcaaaa aacactttat ctgctgcctg cagctcctac 51060

agttgctggt ggataagcct gccaaccagc tcggcgtaat tcttcctgca gagggcaagg 51120

aagagcactt tcacaggaaa attttttttcc gaactgtatg ccgcttatta cataaactta 51180

cgtgctggca aatggagctc cagcaaaata agatattcag agtcaaactt ccttaggaaa 51240

aaaaaaaaaa aaaagcaagc acataacact aatttccttg catgggcact ggggaaggag 51300

gtcgttactt ccgcacgccc gcaggtccgc accaccggga aacccacggg caccgcgcgc 51360

tgcccccggg ccttccaggt gcactgcgcc gcggcgcccc agctgacccg ggatgcgcag 51420

ccctagccct tcccctgtca ccccggccag gaaggggcgg gagcgcggcg gacgccgagg 51480

gcgaagggct tctcggtcct ctgcaccacg cagcaccccc aaggcacaac agggagggtg 51540

cgggaggctc ccgagaccca ggagccgggg ccgggcgtgc ccgcgcacct gtcccactgc 51600

ggcgagggct ggggtcgcct ccagggccgc agctgtcggg agccacctgg ctctcagtcc 51660

cgggtccctg cgacaaccct cgggcccgga ggggaggagg cggccacctg ccgctgccac 51720

ctgcggcacc ggtcccaccg ctccgggccg ggcaggacag gccaggacgt ccctcctggg 51780

ctggggacag gacacgcgac gaggggaccg gggcccccgc ggcgaagacg cagcacgcct 51840

tcccagaaag gcagtcccgt gcccccacga cggactgccg gacccccgcg ctcgcccgcc 51900

catcccttca gaccacgcgg ctgaggcgca aagagccggc cggcgggcgg gctggcggcg 51960

cggctagtac tcaccggccc cgctggctca gcgccgccgc aacccccagc ggccacggct 52020

ccgggcgctc actgatgctc aggagaggga cccgcgctcc gccggcgcct ccagccatcg 52080

ccgccagggg gcgagcgcga gccgcgcggg gctcgctggg agatgtagta cccggaccgc 52140

cgcctgcgcc gtcctccttc agccggcggc cgggggcccc ctctctccca gctctcagtg 52200

tctcatctcc ctatctgctc atcctctggt cgcacataat cgatgtttgg gcgtcccaag 52260

ccagatgtgg accccatttc cgcactctac actggaggtt ttctaagggt ggtgcccgga 52320

ccagcagctt cagcctcatc tgggaacttg agaaaatgca gattctccgt cccacccagc 52380

ctattcggtt tttcctgcac taaaaccatg aaggtggggc ccagcagtcc acattctcgc 52440

aagcccgtca agtgattctg aggcgccctc cagtttgaga gctatgctca cggcctcacc 52500

tccgccccgc aaggagcccg gtcttgcctg tggcgctagc cgcacacgga cacctcatcc 52560

tgcggggccc gccccccccgc tgcaccctca ccgcccaacg cctcctccgg gatgcagcgg 52620

aggcgcctgg aagtcggcaa ggtcaacatc cccctcagca tcttccctac cctcacggct 52680

cctcctccag gggtgcctca tggccagggg ttagaaagag ccactgtgtt tcttgacatg 52740

gaagtggcct aagaccttaa tgaaaactgc aggagtggaa tgacagaacc tttggtcata 52800

cttgagggcg tgaagctcaa atgaggagga aggaaaggat ccagggagaa taaccaaccc 52860

tggcaagttg tggcgcccag gtagaggggc gagcctaggc tagcggttct cgaccagggc 52920

-continued

cggtgttgcc cctcctcgcc gccccgcgta catttgggga ggtctggaga catttttggt 52980

tgtcatgatg cgggagttgc tactgttgcc taagtgggta gacacgaggg tgctcctcaa 53040

catcctacct gaaggacagg actgccccac aaggaagaat gatccggccc caaataagaa 53100

accctgggct ggtcagcaac aacccctttg ttctgagaag agaggaggaa agaataaaag 53160

aagtggggtg aagttttggt ttggtagagg aaacttgaag acattttcac tggaaaggaa 53220

gagaggaaga ggagggagat gtctgtaagg acgagcaaac cgggtgacag ctgatttcct 53280

catattgaag taatgagtcc tagttataat aaattcctaa taaaaaccca gtttatccct 53340

gcaataaact tgtctttttt ttttaaatat actgcttgat tctgtttgct aatattttat 53400

ttacaggctt tgcattgata tgcaaaaatg agatgggcaa taattttctt tttgaatgtc 53460

taatgttgtt tggtttcaga atcaatgtta tgctcacatc ataaaaaatt tggaaccgag 53520

gcaggaggag tgcttgaggc cagaagttcg agaccagtct aggaaacaca gtgagacccc 53580

cccatctcta caaaaaaaaa aaaagaaaaa aaaatgggca tgtttgcttt ttcctttttac 53640

tctgaacaat ttaaggagca ttaaaattat ctattctttg aggtttgatc atttcccagt 53700

taaaaatgtt cctcccagcc tgatgctttc tttggggagg gtaaatcttt taaggctaga 53760

aaagtttctt ctgtggcaat tttattattt acattttaaa aattattcta gagttaattt 53820

tgataaagca tgtatttctt aaaacaaatt atccttttt tccagatgtt caagtgtatt 53880

tgcataaagt tgaggaaagt agtcttttgt gaatctttta acttctccca aatatcttat 53940

tttgtgtatt tttgcttctt tattttgtta acttttaaaa gtgtattttt ttttcaaaga 54000

atcagctctt aggtttatgt ttttggttat actggagctt ttttcttctt ctttttaaaa 54060

tatttttttct cctttatttt ttagacgtat tttgatctaa cgtaatcgga agaaggtaaa 54120

ttagaatctt ttgttactat tgtgttttta tttctcctta tttctctgaa gtcctgcttt 54180

ataaatagta ccatgttatt tgtgcataaa tattcatttg tcttatattc ttgggaattt 54240

tcccacttca tcataaaatg accttccttg tctcatttaa tgtgttcaaa ctttgccctg 54300

aatttaactt tgtctgatat tttaccatcc tgctgaattt tgtttgttac cccaaacaac 54360

ctttgctgtt ttcgtctttt ctgaaccctt tattttaggt aatcccttga attagagcac 54420

taagttttgc tttgtgatta aatctgaaaa tctttatctt gccatagatg agttgagccc 54480

tattcatgtg acagctatat tatgctgttt catagccctt ttggtccttt tttcactctt 54540

gcattgcata ttttgtgttt attgtgtttt gtgtttcttc tgataatttg gaaggtttgt 54600

atttttattc agggagttgc cttataatca tactccgcaa tacacatcgt cctcagtttc 54660

ttcagactgt ctgttaactc cctattctga ataaaaatga cattgtaatt tccctctttt 54720

ttctttaccc cttttcttct cctcacctaa tgtaaatgat tttatccttc tttagtattt 54780

gctttttaa ttaactacat ttataaatat ctttatcact tgatttttaa atcagctttg 54840

aatgagatat ttggattcct agatataaaa gatgttaatt ataccatttc cacgttagta 54900

ggtttataaa atcatacatt ctgctgtgta accataatcc cacgtttgtt ttagttccac 54960

tcctacagtt aaaagattca gaagtattat taacagttat tttgccatag ttttttcccc 55020

aacccatttt gtggtaagtt atgatcctgc tttagtttct taagaataat ttatagagca 55080

gagtgtggtg gctcacgttt gtaatcccag cactttggga gacaagaggt agaaggatcg 55140

cttgaagcca gcagttcaag accaccctga gcaacatagt gagaccttgt ctctacaaaa 55200

-continued

aattttaaaa tttagccaga cgtagtggcg tgtgcctata gtcccagcta ctcaggaggc 55260

tgaggcaaga ggattgctag agcccagaag tttgaggctg cagtgacctc tgattgtgcc 55320

actgcacccc agtctgggca agaaagtgag aacctatctc tttaaaataa caataataac 55380

ttatgaaaat tatattccct gagtttttca tgtttaaaaa tatttgttgc ctttatcctg 55440

taaaagtttg agtataaatt cttgggttat actttattta ttgaagaatg tataagtatt 55500

gtcttctaga attgagtgtt gctgtaatga aaccagaagt cagcctggtt tatttttcct 55560

cagaaatgag gtaattgccg gcggacacc gtggctcatg cctgtaatcc caacactttg 55620

ggaggccgag acaggtggat cacgaggtca ggagattgag accatcctgg ctaacatggt 55680

gaaaccccgg ctctactaaa agtacaaaaa gttagctggg catggtggtg gacgcctgta 55740

atcccagcta cccgggaggc tgaggcagga gaatggcgtg aacctgggag gaggagcttg 55800

cagagagctg agatcgcgcc actgcactcc agcctgggcg acagagtgag actccgtctc 55860

aaaaaaacaa aaaaaaaaca aagaagtgaa gtaattgcca tgatgctcca agaattatct 55920

ctttgtctat gaaatccaga aatctcactg ttatacattt tggaattatt attctgggcc 55980

aatatttcct gggacacaat agattgactc tatagattta attttttttt ttttttgag 56040

acagagtctc actgcaatct cagcttactg caacctctgc ctcacgggtt caagcaattc 56100

tcctgcctca gcctcccaag tagctgggac tacaggcgcg tggcaccatg cctggctaat 56160

ttttgtcttt ttagtagaga cagggtttca ccatgttggc caggctggtc ttgaacgcct 56220

aacctcaagt gatccacctg cctcagcctc ccaaagtgct gggattacag gcgtgagcca 56280

ccatgcccag cctcaattcc tctttctatc tggtaatttt tctgaagttg aaaacatttg 56340

ttctaatacg ttatttcagt gttcttctaa gatgtgtaaa gcaccctatt cccaggtcag 56400

cccccatctt gctagtgagc tcggctggtt cttcacaaga gctctggttt tctcctgctt 56460

aatctcaagt acctctgtca gcctccacct ggtttatgat ttggagtttt ttggtttttg 56520

ttttttgttt ttgacagagt cttactctgt cacccaggct ggagagcagt ggcataatct 56580

cagctcactg caacctctgt ctcccaggtt tgagcgattc tcctgcctca gcctactgag 56640

tagctgggat tacaggcgcg tgccaccaca cccggctaat ttttgtattt ttagtagaga 56700

tggggtttca ccatgttggc cagggtggtc ttgaactcct gacctcaggt aatccacctg 56760

cctcagcctc ccaaagtgct gagattacag gcgtgagcca ccgcgcctgg catggtttgg 56820

agttttaatc tgtagtttta ataaagatag tgcttatgtt tgtgtttctt atatttcttg 56880

gtactcttgg gtaatttgta agatccccat atctacacaa gaagtccatt ttcaattctt 56940

ttcttcagac tgtttatttt attttatttt attttatttt tatgtttgag atggagtctc 57000

gctgtgtcac ttctggaggc tggagtgcag tggcgcgatc tcaggtcact gcaacctccg 57060

tctcccgggt tcaagcaatt ctcctgcctc agcctcccga gtagctggga ttacaggcac 57120

ctgccacttt ttaatttttt tagagacaga gtctcgcttt gttgaccagg ctggagtgcg 57180

gtggtgcaat catggctgac tataacctcc aaatcctggg ctcaagtgat cctcctgcct 57240

cagcctcctg agtagctggg actacaggca catgccacca tgcccagtta attttaattt 57300

ttttgtagag acagggtctc catatgttgc ccaggctggc ctcctactcc tggcctcaag 57360

taatcctcct acctcagcct cccaaattac taggattata agcatgagcc accatgccca 57420

gccttgttct actactttaa tttcatatgt taggtgacca tgtaattgat catccaaacc 57480

-continued

aggatactgt aagaatgaaa gaggctgaca gtagtatgat gctgggacta gcattgtgca 57540

ctgagattat ttctgggaaa gcaggagata cggtcaccct acttatagtg tgcttgtctt 57600

tggattgttg aatttggagt ttctatttgc aggcttattt caactgggca gccttgatcc 57660

gccctgccca gcaatgctac cgttctctcc accgggtctc tgggaccccc tcagtcacta 57720

tacttagctc agttccccac cctcccactc cctaaaagcg taaccaggaa tcctgcctca 57780

ggtctactgc cgtcttccgt gggctgtttc agttcctatt acccagagtc aaactcccag 57840

cattcccctac ctgattccag acttggagtc cagagcttta acctcttcag gccaactccc 57900

cactttgcat ttctgtccct atatcttagt ccatggagat acatttcatg tctttgagtc 57960

tacttacaaa gtaaattttg ctgtttttta attttttttt tgagatggag tcttgccctg 58020

tcacccaggc tgtggtgcaa tgacgccatc tcggctcact gcaacctccg cctcctgggt 58080

tcaagcgatt catctgcctc agcctcccaa gtagctgtga ttacagacag gcaccaccac 58140

gcccagctaa ttttttttat cttttagtag agacagggtt tcaccatgtt ggccaggctg 58200

gtcttgaatt cctgacctcg tgatctgccc atctcggcct cccaaagtgc tgagattaca 58260

ggcgtgagcc actgtgccca gccaattttg ctttttttat atttcattgc tatatgttta 58320

gaggataagt ttacagtgct atatgcattc ccaaatatta gaccaaaaaa atctccaaaa 58380

aattagaaag aaaatccaaa aaatctcaaa aaataccaaa aagcaacaat ctcacagacc 58440

atactcactg acccccaata aaataaaatt agaaattaac cacaacttaa caaaataaag 58500

tactcaagtc agagaggaaa gaggaaataa acatcaaaat tacaaagtct aggcggtggc 58560

tcacgcctgt aatcccagca ctttgggagg ccaaggcggg cagatcacaa ggtcaggaat 58620

tcgagaccag cctggccaat atggtgaaac cccgtttcca ctaaaaatac aaaaattagc 58680

caggcatagt gatgtgtgcc tgtaatccag ccacttggga ggctgaggca ggagaatcac 58740

tgaacccagg gagacgaaga ttgcagtgag ccaaaatcgt gccactgcac ttcggcctgg 58800

gtgacaaagc gagactccat ctcaaaaaaa aaaaaattac aaactcttta gatagaaatt 58860

ttggtgtttt tttttgagac ggagtctcac tctgtcgcag aggctggagt gcagtgggac 58920

tatgtcagct caccgcaacc tccatctcct ggattcaagc aattctcctg tctcagcctc 58980

ccaagtagct aggattacag gcgcccacca ccagacccag ctagttttta tatttttagt 59040

agagatggtg tttcaccatg ttggccaggc tggtctcaaa ctcctgacct caagtgatcc 59100

acctgcttca gcctcccaaa gtgctcagat tacaggcgtg agccaccgca ccccacctag 59160

atagaaattt caacatgagg ccgggcacaa tggctcacgc ctgtaatctc agcacttcag 59220

gaggctgagg cgtgggagga tcacttgggc ccaggagttc aggaccagca tgggtgacag 59280

agacagaccc tgtctctatt tatttgaaaa aaaaaaaaaa aaagagagag agaaagaaat 59340

ttcaacatga aaagtatctc tcaaaccctt cgagatgttg gcaaaaagcg actcaaagga 59400

aaatgtatta ctgtgtgtga atttgcttga aaataagaaa gaggccgggt gtggtggcta 59460

acacctgtaa tcccaacact ctgggagtcc gaatcaagtg gatcatgagg tcaggagatc 59520

gagaccatcc tggctaacat ggtgaaaccc tgtctctact aaaaatacaa aaaattagct 59580

aggcgcggtg gctcatgcct gtaatcccag cactttggga ggctgaggca ggtggatcac 59640

ctgaggtcag gggtttgaga ccagcctggc ctacatggtg aaacctcgtc tcttctacaa 59700

atacaaaaat tagctgggcg tggtggtggg tgcctgtaat cccagctact cagaggctga 59760

-continued

```
ggcaggagaa tcgcttgaac ccgggaggcg gaggttgcgg tgagccgaga tcgcaccact  59820
acactccagc ctgggcaaca gcctgggtga cacagtgaga ctccatctca aaaaatacaa  59880
aaaattagct gggtgtggtg gcctgcgcct gtagtcccag ctacccggga ggctgaggca  59940
ggagaatgga gtgaacctgg gaggaggagc ttgcagtgag ccgagatccc accactgcac  60000
tccagcctgg gcgacagagc aagactcttg tctcaaaaaa aagaaaaaaa aaggaaaaaa  60060
gaaccctgat aataaagaaa ccaaatgttc aactctcaaa gctcggacac tttaaagaaa  60120
taattaataa aggcagaagt taaagggagg atgataaagc aatttttttt gttggttttt  60180
ttgagatgga gtcttgctct gtcacccagg ctggagtgca gtgatgcgat cttggctcac  60240
tgcaacctct gcctcccggg ttcaagcaat tctcctgcct cagcctcctg agtagctggt  60300
actacaggtg cgcgccacct ggcccagcta atttttgtat ttttattaga gacggggttt  60360
caccatattt gttaggctgg tctcaaactc ctgatctcag gtaatctgcc cacctcggcc  60420
tctcaaagtg ctgggattac aggcaggcgc caccgcgcct ggcctaaagc aaaatattgg  60480
ttctgtgcaa aaggtcaata aaaagagcaa acgtttacaa actggagcca gcacccattc  60540
agctcagtgt gtctggagaa aaaacaatct cgcttcagaa ttcatgatta cgcagccctt  60600
tttgcttcct aaaaatccta ctatgttgct gttgaccatt ctctctcttt ctctctctct  60660
tgctttctct ccagaaaagc tattcagaca ttctcctctt tcctcaaacc tccaacactt  60720
cctcctccat ccttagcctc agctgctgac ctcacttcta atcattgaga aaccaggaga  60780
agcatttaag agtgaacctc cgcctccccg cacgggcaaa accacccacc cacagaattg  60840
tgccccaatt ctgcgtcctc tcctctcacc atggatggac ggtccaggct ccgagccaaa  60900
gccaggcctc ccctggagct ctggatccac cacctgcagc ttctcaggca gggccccagc  60960
agctcccctg ctcccttgta ccatcaatcc ctcccctcac tgggtcactc ccaacaatat  61020
atatatttag tgatgtttct cccatgtggt aaaatcactt agcctctctc ctcccccagc  61080
tactatccta tttgtttctt tccattctct gcaaaacttc tcaaagcatt gtgtctatgt  61140
gctgactcca tttatcttct cccgttctct gctgagtcct tcccacagac tctcacccca  61200
gttactccat gaaatgacct ctgcactgcc acatccaatg gtgaatgttc agttcttaat  61260
tttattcagt ctttcagcag catttgacct ggccgatcac tccctcttct taaaaatact  61320
tttctcagcc aggcgtgatg gctcacacct gtaatcccaa cactttggga ggccaaggcg  61380
ggaggatcat gagagcccag gagttcaaga tcagcctggg caacatggca agaccctatc  61440
tctacaaaaa ctaaaaagta gccagtgtga tggcatgcac ctgtagtccc atctacttag  61500
gaggctgagg cagtaggatg acttgagcct gggaaatcaa ggctgcagtg agccatgatt  61560
gcaccactgc actccagcct gagtgacagc gagaccctgt ctcaaaaaga caaaatagga  61620
aacttttctc agcatattcc tctgattctc ctgctgcttc tgtctgcaca gattcagtct  61680
cctttgccgg ttcttcctca tcctcctgat ctcttgacct tgaagtgccc cagagtacag  61740
tctttttttt ttttttgag acgcagtctc gtctgtcacc caagctggag tgcaatggcg  61800
aggtctcagc tcatgcaacc tctgcctcct gggttcaagc gattctcctg cctcagcctc  61860
ccaagtagcc aggactacag gcacatgcca ccatgcccag caaattgttg tatttttagt  61920
agagacaggg ttttactata ttggccacgc tggtctcaaa ctcctgaact cgtgaaccac  61980
ccgcctcggc ctcccaaagt gctgagatta caggcatgag ccaccacacc cggcccagag  62040
```

-continued

tacagtcttt agacggcctc tctacctata cttgctcccc tcataaactc ctcctgcctc 62100

atggctttaa ataccatcgg tagactgatg actcccatat ttctcttttt tttttggaga 62160

cggagtctcg ctcagtcccc caggctggag tgcagtggcg cgatctcggc tcactgcaag 62220

ctccacctgc caagttcaca ccattctcct acctcagcct ctccagtagc tgggactaca 62280

ggcacccgcc accacgcctg gctaattttt ttgtattttt agtagagatg gggtttcacc 62340

atgttagcca ggatggtctc gatctcctga cctcgtgatc cgcccatctc ggcctcccaa 62400

agtgctggga ttataggtgt gagccaccgt gcccagccga tgactcccat atttctatct 62460

cttgctgtgt gggagttctc ctcagaactc catactcata aatccaactc tcataaatag 62520

tatctcaaat gggcaatatg ctcaaaagtc aattcctact tttctcccta aacttgcttt 62580

cctgcagtct ccaccatctt aatgtccaat ctaacattag gaggcaaaaa ctttgaagtc 62640

attcttgact cttctctatt acacacccta tccaatcttt ctgcagatcc agtcgacccc 62700

caaatccagt tagctctcat catctccccc gttacccccc ggtccaggcc atcttcctct 62760

ctcacctgaa tcactgcagc attctcctca ctggtctctt tggttctgtt ttcactccac 62820

cttagcatag tctccacaga gcagtcagag ggatcctttt aaagtgtaat tcccatcctg 62880

tccctgctct gctcaaaacc ctgtcgtgat tcccgtttta atctgtcaga ttaaaagcca 62940

gagtctttcc agtgacctac atgatctgcc tattatcacc tcccacttct ttccccttgc 63000

tcactccact ccagctctgc agctgtcctt tctgtttcct gaacagccca gattttgctt 63060

ctttagaacc tttgtatttg ctgtcccctc tgtctggaat gtttttccag gaagtcacct 63120

ggctctctcc tgcacttcct tcctgaccac catgtttaaa aatcactcaa acacacttca 63180

ggccggacat ggtggctcac gcctgtaatc ccagcacttt gggaggccaa ggtgggtgga 63240

tcacctgagg tcaggagttc gagaccagcc tggccaacat ggtgaaactt cgtctctact 63300

acaaatacaa atagtagcca ggtgtagtgg cacacacctg taatctcagc tactcaggag 63360

gctgaggcag gagaatcgct tgaacccaga aggcagagga ggtgcagtga gccaagatca 63420

cgccacaaca ccccagcctg ggtgacagag caagacccca tctcaaaaaa aaaaaaagaa 63480

aaaaaaatca cacaaacaca cttctcttca tattcctttt ccaagtttta tttttctcca 63540

gaatacttta cattgtttta atggaagttc tccgtttccc cccaactaga atggatactt 63600

cctgcaggta ggcactctag tcctcccatc caagtactaa ccaggctcaa ccctgcttag 63660

cttctgagag caggggagat caggcctgtt cagggtggta tggcccagga attttgattc 63720

tgttttattc attgctgttc tgttgattct cttttgttcc tcctcctagt gctgagaaca 63780

ctacttgtac ataataagca ttcaataaat atttgttgaa tgaatgactt gttgaatgaa 63840

ttaatctcag aaatgcagga ctggttctac attagaaaat ttttcaaggt cattctctgt 63900

tgtcgtaaca cattaagaga ggaaaatttt gtactctaaa tcatttgata aaatacatac 63960

tgatttctgt tttcaaaaac tcttagtggc tgggcgaggt ggctcacatc tataatccca 64020

gcattttggg aggacgaggt gggcggatca cttgaggtca ggagtttgag accagcctgg 64080

ccatcatggt gaaaccctat ctctactgaa aatagaaaaa ttagccgggt gtggtggcgc 64140

atgcctgtag tcccagctac ctgggaggct gaggcaggag aatggcttga acccgggagg 64200

cggaggttgc agtgagccaa gatcatgcca ttgcactcca gcctgggtaa cagagtgaga 64260

ctccatctca aaagaaaact cttagtgagt ttaggaatcc aaggaagacc ctcaaactaa 64320

-continued

atagataatc tagctaccag aagccttcag taaaccttaa cactccatgg tgaaacatta 64380

gaaacattcc tactaaaaga caggctaaga atgcctgcaa tcttcacggc tagtccaaga 64440

agtcaaaaag aagaaatgag cgctgattta aaaaaataaa caaacaaaaa actaccgatg 64500

cagaggctgg cagcaaggac tgaaggactg tacagtactt gcctggagca ggcggatggc 64560

cacacccctg cgaagcctgc tcagctggct gggggacgct ccagtgtgtg agtggcagga 64620

tgcagggtac ttcctctgcc agggagttgc actggggaga tcctccccca ctcacacttt 64680

ggcagctggg gctttggaat gtgacttagc ttctgtcaaa gggtcaatcc acccttttgat 64740

atatgatgca aaggcgaaca tatgatgcaa aggtgagaga acagcccaaa ttaggacttt 64800

taccacagct gtggaggtgg acagcgacag tggtgggccc tggccagact tttcatgctc 64860

aaaggtggtg gttgttcttc ctacttcttg tccctccagg gcttcctttg cctgtgtgct 64920

gaacctgctt cttttaattt tttttaactt ttttaaattt ttaattgttt taattaaaac 64980

aaattttgaa aactgtctga acctgctttt gaaccctgct atgatttgaa tgtttgtccc 65040

ctgccaaact gattttgaaa cttaatctcc aaagtggcaa tattgagatg gggctttaag 65100

cagtgactgg atcatgagag ctctgacctc atgagtggat taatggatta atgagttgtc 65160

atgggagtgg catcagtggc tttataagag gaagaattaa gacctgagct agcatggtcg 65220

ccccttcacc atttgatatc ttacactgcc taggggctct gcagagagtc cccaccaaca 65280

agaaggctct caccagatac agctcctcaa ccttgtactt ctcagcctct gtaactgtaa 65340

gaaataaatg ccttttcttt atgaattacc cagtttcaga tattctgtta taaacaatag 65400

aaaacgaact aaggcaaact ctcatgattc tactgccatg ccattccaat aaactccctt 65460

tatgcttaag agagccagag ttggccaggc gtggtgactc acgcctgtaa ttccagcact 65520

ttgggaggcc gaggcaggtg gatcacaagg tcaggagatc gagaccatcc tggctaacac 65580

ggtgaaaccc cgtctctact aaaaatacaa aaaaattagc tgggcgtggt agtgggtgcc 65640

tgtagtccca gctactcggg aggctgaagc aggaggagaa tggcgtggac ccaggaggcg 65700

gagcttgcag tgagtcgaga tcgtgccact gcactccagc ctgggtgaca gaatgagact 65760

ccgtctcaaa aaaaaagaga gccagagttt atttctgttg cttgcaacca agaaatctgg 65820

ctggtgcact gaagtttcca taaataatag caatttaaag actctttcca agccaggcaa 65880

tgcctagcct tgtgtagtcc ttgtggtaat acattcattc attcatttgt tcaaccaact 65940

gtgctccaga gactaagaat acaaaaatgg gggccgggtg tggtggctca cacctataat 66000

cctagcactt tgggaggccg aggcaggtag atcacctgag gtcaggagtt cgagaccaac 66060

ctggccaaaa tggtgaaacc cctactctac taaaaataca aaaaattagc tgggggtggt 66120

ggcggacacc tgtaatccca gctactcgtg agactgaggc aggagaatca cttgaacccg 66180

ggaggcagag gttgcagtga gccgagatcg caccactgca ctccagcctg ggcaacaaga 66240

gcgaaactcc acctcgaaaa aaaaaaaaaa aaaaaaagag ggccggggct gggcgcagtg 66300

gctcacgcct gtaatcccag cactctggga ggccaaggca ggagaattac gaggtcagca 66360

gatcgagacc agcctgacca acatggtgaa accccatctc tactaaaaat acaaaaatta 66420

tccgggcgtg gtggcgcaca cctctagtcc cagctacttg ggaggctgag gcaggagaat 66480

cgcttgaacc cgggaggcag aggttgcagt gagccgaaat catgccactg cactccagcc 66540

tgggtgacag agtgagactc cgtctcaaaa aaaaaataaa aaaaaaaaaa gaattcaaaa 66600

-continued

attgtagagt tatagtgtgc ttctagttta gttgagagga catctgtcct tcaaggaagg 66660

ctagaatcta taccctgagt ccttactgaa atcaatccag cagtcaaaac atgggaccaa 66720

cgatcacagc agtaagatag gaagagcacc tttgtacatt tagctcatgt tgagataagc 66780

cactgacaga gctgaaggaa gctcacagtt ctgggttcca tcctttggca tttaaaaaga 66840

aaagtgctaa gaaaattcgg ttggtcacgg tggctcacgc ctgtaatccc aacactttga 66900

gaggccaagg caggcagatc acgaggtcag gagttcgaaa ccagcctggc caacatggtg 66960

aaaccccgtc tctactaaaa acagaaaaat tagccgggca tggtggcgca tgcctataat 67020

cccagctact caggaggctg aggcaggaga attgcttgaa cccgggaggg ggaggttgca 67080

gcgagtgaga gcaggccact gcactccagc ctgggagaca gagcaagact ctgtctcaaa 67140

aaaaaaaaag aaaaaaagaa agaaaggaaa aaaagaaaga aaaaaaaaga aaaaagaaaa 67200

ttcaggccag gccaggcctg gtggctcaca cctgtaatcc caacactttg ggaggctgaa 67260

gcgagacggt gccttagccc aggagtttga gaccagcctg agcaacatag cgagaccctg 67320

tctctataaa aaaaaatttt tttttggcca gacgcagtgg ctcacgcctg taatcccagc 67380

actttgggag gccgaggcag gtggatcacg aggtcaggag atggagacca tcctggctaa 67440

cacggtgaaa ccccatctct actaaaaaat acaaaaaatt aaccgggcgt ggtggcgggc 67500

gcctgtagtc ccagctactc gggaggctga ggcaggagaa tggcgtgaac ccgggaggcg 67560

gagcttgcag tgagccgaga ttgcgccact gcactccaga ctgggagaga gtgagactcc 67620

gtctcaaaaa aaaaaaaaaa aaaaaaaaat taattgtcag gtgtgctggc atgcagctgt 67680

agtcctagct actcgggagg ctgaggtaag aagatcgctt gagcccagga gttcaaggct 67740

gcagtaatag tgcctctcac tctaccctgg gtgacaatga gaccctctct caaaaagaaa 67800

gaaaaaaggg aaagaagaaa agaaagaaag aaagagaaga aaggaaggaa gaaagaaaga 67860

aaaagaaaag gaaggaagga agaagaaaaa aaaagaaaga aagaaaagag agagaagttc 67920

aaagaccaaa gggtcaggat cccaaaatag tttttatgtt ttatttattt atttacttat 67980

ttatttttga gacagtatgg ctctgtcgcc caggctggag tgcagtgatg cgattgcggc 68040

tcactgcagc ctccaaactg ggctcaggtg gccctcccac ctcagcctcc cgagtagctg 68100

ggaccacagg cgcgtgccac catgcccagc taatttttta attctttgta gagatgaggt 68160

ctctatatgc tgcccaggct ggtctcgagc tcctgggctt aagccatcca cccgcctggg 68220

cctcccaaag tgctgggatt acagaagtga gccaccgcgc ctaatcgggt ggtttgtttg 68280

tttattgacg gggtctcgct gctgcccagg ctggagtgcc agtggctgtt cacaggtgca 68340

gtcctggagc attgcatcag ctcttgggct ctagcgatcc tccagagtag ctgcagctgg 68400

gattccaggc gcgccaccgc gcggggctca gaatgggttt ttatattgag ggttatgctg 68460

ccacctagag gatatatgta gtaccgaact gtgtgcgcag ggaggctgag gttgcagtga 68520

gccaagatga tgccagggca ctccagcgtg ggtgacagag caagatttca tctcaaaaaa 68580

aaaaaaaaaa aaaaaaaaaa aagaattgaa agtaaggtct tgaagagata tttgtgcctg 68640

tatggtcata gcagtattaa ctttgaccca ctagctaaaa cacaaaagca acatgtgtct 68700

gtcagcaggt gaacggataa acaaaatgtg gtatatatgt acaattgaat attattcagc 68760

ctttaaaaag gaataaaagg ctggatgcgg gggctcacgc ctgtaatcct aacactttgg 68820

gagactgagg tgggtggatc acccgaggtt aggagtttga gaacagcctg gccaacatgg 68880

-continued

tgaaacttca tctctactaa aaatactaaa attagccggg catggtggca cttgtctgta 68940

atccaagcta ctggggaggc taaggcagga gaattgcttg aactcaggag ccggaggttg 69000

cagtgagcta agatggcacc actgcactcc agcctgggca acagagtgag actccatctc 69060

aaaacaaaca aacaaaaaat tattatttcc aaagaaacaa gaccctgggt ccatttccca 69120

gcccacacct gatgttgact cacaacacac agcctggttt gctatgagcc tgcttcattt 69180

aattgtcacc ttaacttcac atcaccctca agtcctggaa taactctttg ctgacctttg 69240

tgtgctgagc catctccatg tcgctcaacg tgcagtccct ctcactgcac tgagtcaata 69300

gccagacgtg gtctgactgc agggtcatcc ttggtggctt aggctgactc gggcatagca 69360

gggtgctctg agacctcacc gcatataggc tttgccccca ataaactcta tataatattc 69420

atattatgtg gtctgggtgt gtgtagcttt gcactgtctt ctcgtgacag tgccctcaac 69480

ctctttccca ggatttcctc ctctacctcc tcaagtccca ctgctctgca aagaccaaaa 69540

gctgcagagt cccagctccc tcctttacac cccacgacgc agcctcctct ctcagaaccc 69600

tttaaacaga gtcttttact gcagatccca agaacagcca cacccctctc tcccacccac 69660

tccagacaca cccaggtaat tatagcaccc agggtaacta tgtagatgga gtccctggaa 69720

catgtggata gtgcccctg ggagtatgca aaagcaacat tgctggcacc tgcagagaac 69780

agggtgacat ccaggaatca gagcatgggc ctctgggagg tagggatgtg gccaggcagg 69840

ctgccaaaaa ttggtagagc aaggccacag gatctttctg accttccttc caaacagagg 69900

ctcctgtact ggtgatccct gtgttgattg accactccct tcctgggggt cgtggtctct 69960

gtcccagttg cccggacttc tgtgagtgtc ctactgaggt ccttttcatg agaagcatgc 70020

tgtccttcca cctgctggga gcaagagtga caacttcaat actataatag cagtggcata 70080

cagagaagaa gaaagatgaa gtggcaagaa aaacaggctt ccaagcagga gtttttctat 70140

aaaaacaaaa acgtttacaa gcaaactttt tataaagggc tagatagtaa atattttagg 70200

ctttgagagc cacatagact tgtttgcagg gactcaatgt cgctattgta gtttgaaagc 70260

agccatcagg gttatgtaaa tgagtgagtc tgattttgtt tcagcaaaat tttatttacc 70320

aaaacagaca atgagtgggc tggatttggc ccatgatcct tagtttgcca actcctgctt 70380

tgggctcacc cagatctgat tttgaattct ggctctgcta ctggttagct gcaggagctt 70440

ggaaggctct ctgagcctgt ttcctcatct gtaaaattaa agcaataatt tctaacactc 70500

aagagtgtta cctcacgcct gtaatcccag cactttggag gctgaggcag gcggatcacc 70560

tgaggtcaga agttcaagac cagcgtggcc aacgtggcaa aaccctgtct ctactaaaaa 70620

atacaaaaag tagccgggca tggtggcgcg catctgtaat cccagctact tgggaggctg 70680

aggcagggat actgctagaa cctgggaggt ggagcgtgca gtgagtggag atcacacctc 70740

cacactccag cctggccgac agagcgagac tccatctcaa aaaaaaaaaa aaaaagagtg 70800

ttagaaggtt ttgagataat gaataaaaga tgccttgtgt atactaagta ttcaacaact 70860

gatagctgca ttggtctaat tataacagtt tagaagcgat tgagtcaaca aatgctggat 70920

ttgtcaggga ggacttccta tcaggaggta gatcttgggc tgagtcctga agcaaagata 70980

ggcattggat agaggagttg agagaacacc ctaggactgt tattattatt attcgacacg 71040

gagtctcttg ctctgtcacc caggctggag tgcagtggcg cgatctcggc tcactgcaac 71100

ctctgcctcc caggttcaag cgattctcct gcctcctaag tagctgagac tacaggtgtg 71160

-continued

tgccaccaca cccggctaat ttttatattt ttagtagaga cagagtttca ccatgttggc 71220

catgctggtc tcgaactcct gacttcaggt gatccacccg cctcagcctc ccaaagtgct 71280

ggaataacag atgtgagcca ccgcacccag cccagaacca tttttcaatc cttggctctg 71340

ccttttatta gctgcaagat ctcaggcaat ttatttaacc tctccaaaga ctcatttttt 71400

cattcacaaa atgaggcaaa taataatatc tactatccca ggttgtcatg agaattaaat 71460

gcaacatgac atttaatgaa atgagaagtc ccttggacat taactggcta aagtatgtgc 71520

tcgacaagga tatcatttta ggtggatact tagcatctca gaactgatgc tcacaatgga 71580

atatcattga aacgcattaa aattcatttt aaatgattgt aggtagtgag gcaattgaaa 71640

gaagaagaca agaggactga ttataatgct tcaggctcac tagtctcctt ttaggaggga 71700

aaaacaattt caagttaaat tttaggctct agatttttac ccctgctgct cattagaatc 71760

acccagattg atgaaatcag agcccatctg aggctgtgtt tttcatctcc agaatgagag 71820

ctgttgtggg gattaagttt ttgaaaaagt acatctaaca ggtgatcgaa aatgatagtg 71880

atattattgc agtgatggtc attattgttg ttattattat actgaaagag gcttcagttt 71940

tctgatccat aaagtgaggg aattgcatga gaccattgct aagattcctt ctagctctgt 72000

ttttttgttt ttgtttttta gacagagtct ctgtcgccca ggctggagtg caatggcatg 72060

atcttggctc actgcaacct ccgcctcccg ggttcaaatg atcctcctgt ctcagcctcc 72120

gaagtagctg ggactacagg cacacaccac catgcccagc taacttttat atttttaata 72180

gaggtggggt ttcaccatat tggtcaggct ggtctcaaac tcctgacctc aggtgatcca 72240

cccgcctcgg cctcccaaca tgctgggatt acaggcatga gccactgtgc ccaacccctt 72300

ctagctttct tgatcactga ttctagggtt ctctgctgaa atatatttga gacatcctgg 72360

ataaaagatc atgcaagagc tcccaatatg gtattaataa ttgattctgg aggcttagct 72420

actcctgatg gattagacat gactcaactg cctctcttat gtgtacaaca caacaacaca 72480

accaagaaag gttattctgg cattccattt attcagttta tttacagccc ttacttccag 72540

cagcacgtta aagatatggc cagggccggg tgcagtggct caagtctgta atcccaggac 72600

tttgggaggc caaggtgggc ggatcacaag gtcaggagtt tgagaatctg gcaattcttc 72660

agacttagaa gcaaccagct cgataacaca gtcttgtgtg ggctctccct ctgtcctcc 72720

ctcgcttccc tcatttctca tccctgcccc tgagactgtg caccttcaca tagccctgcc 72780

atgagacctt catctcaggc tttgctttct ggggtaactg aggctaaaca ctgagtggcc 72840

ctaaaagagg attgggattt ggaagttaga ttattcacca gagaacagac tttgctgatg 72900

atcaggccca ggttgtaatt gttgaaaaaa agagaggatg catagtctta tctcatctcc 72960

tagtcaaagt caacaccatg ataaataaga gtcaaatcct gagatgtgaa ttggggacat 73020

ttgagtggtt aaccctgaga agcttgcacc ttcagacccc tcaatacccc tgctccccag 73080

agaaggctgg acattgacct cagcacaggc aggagccctg caagatgcca tttgtcctac 73140

taaagatgga cccctccact ctgtttctag gtaaataacc aaagtcaagt ctccacacag 73200

cctgagcaag aaagtcagag cctgctacag gagaaaatac cacactggcc aaaggattca 73260

ctagccctgg ccactgtgtg tgggaggaac cagggaatca tgtgtgggag tcaatgttga 73320

agctgttgga ctgggggtgg ggtggaatat aagcctggcc ctggggagtt tttcccgttt 73380

gagggccttt acccacaact caagatccag tgctatagca ggagatccca gagctagtcc 73440

-continued

taacagatgg tcaggattga acttggccta gagtaaaatg aggaggatag tgccagaact 73500

ttctcaacat actattgagg aagaggtcag aaggcttaag gaggtagtgt aactggaaag 73560

gggtcctgat ccagacccca ggagagggtt cttggacctt gcataagaaa gagttcgaga 73620

cgagtccacc cagtaaagtg aaagcaattt tattaaagaa gaaacagaaa aatggctact 73680

ccatagagca gcgacatggg ctgcttaact gagtgttctt atgattattt cttgattcta 73740

tgctaaacaa agggtggatt atttgtgagg tttccaggaa aggggcaggg atttcccaga 73800

actgatggat ccccccactt ttagaccata tagagtaact tcctgacgtt gccatggcgt 73860

ttgtaaactg tcatggccct ggagggaatg tcttttagca tgttaatgta ttataatgtg 73920

tataatgagc agtgaggacg gccagaggtc gctttcatca ccatcttggt tttggtgggt 73980

tttggccggc ttctttatca catcctgttt tatgagcagg gtctttatga cctataactt 74040

ctcctgccga cctcctatct cctcctgtga ctaagaatgc agcctagcag gtctcagcct 74100

cattttacca tggagtcgct ctgattccaa tgcctctgac agcaggaatg ttggaattga 74160

attactatgc aagacctgag aagccattgg aggacacagc cttcattagg acactggcat 74220

ctgtgacagg ctgggtggtg gtaattgtct gttggccagt gtggactgtg ggagatgcta 74280

ctactgtaag atatgacaag gtttctcttc aaacaggctg atccgcttct tattctctaa 74340

ttccaagtac cacccccgc ctttcttctc cttttccttc tttctgattt tactacatgc 74400

ccaggcatgc tacggcccca gctcacattc ctttccttat ttaaaaatgg actggggctg 74460

ggcgcggtgg ctcatgcctg taatcccagc actttgggag gccgaggcgg gcggatcatg 74520

aggtcaggag atcgagacca tcctggctaa cacggtgaaa ccccgtctct actaaaaatg 74580

caaaaacatt agccaggcgt ggttgcaggt gcctgcagtc ccagcggctc aggaggctga 74640

ggcaggagaa tggcgtgaac ctgggaggtg gaggttgcaa tgagccgaga ttgtgccact 74700

gcactccagc ctgggtgaca gagcgagact ccgtctcaaa aaaaaaaaaa aaaaaaaaaa 74760

tagctgggca tggtggcgcg tgcctgtaat accagctact ctggaggctg aggcaagaga 74820

atcgcttgaa cccagtaggc ggaagttgca gtgagccgag atcttgacac tgcactccag 74880

cctggtgaca gagtgagact ctgtctcaaa aaaaaaaaaa agaaaaaaaa agacagaaag 74940

aaagagcaca gacagagtca caggtatttg cagtaggaag ctgtcaggtt agagtgcacg 75000

gaaatagaaa gtatatttta cacttacagc acatcttcgt ttgattagcc acatttaaaa 75060

tactgaatag caacgtgtgg ctatttagta ttcactaaaa tcttggacag tgcaagtcta 75120

aagaatcctt gatccgtccg gcatggtggc tcacgccttt aatcccagca ctttgggagg 75180

ccaaggtgga aggatcactt aaggtcagga gttcgagacc agcctggcca acatggtgaa 75240

acctcgtctc tactaataat acaaaaaaaa ttagccgggc atggtggtgc atgcctgtaa 75300

tcccaggtac ttgggaggct gaggcaggag aatagcttga atccaggagg cgctgcagtg 75360

agccgagatc atgccatgcc actactgcac tccagcctgg gcaacagagt gagactgtct 75420

caaaaaaaaa aaaaaaattg ttgggcgtgg tggctcacgc ctgtaatccc agcactttgg 75480

gaggctgagg ggggtggatc acctgggttc tggagttcga gaccagcctg gccaacatgg 75540

tgaaacccca tctctactaa aaatacaaaa attagctggg cgtggtggtg ggcacctgaa 75600

atctcagcta ctcaggaggc tgaggcagga gaatttcttg aacccaggag gcagaggttg 75660

cagtgagcca agatcgcgcc tctgcactcc atcctgggtg gcagagcaag actatgtctc 75720

-continued

aaaaaaaaaa aaaaaaatac ttgattgtct ggacattctg cagaacatca tatggagaca 75780

ctatgttgac gacatcatgc tgattgtaag caagaaatgg caagtgttcc agaaacacag 75840

tcaagacaca tacatgccag aaggtgagat ataaactcta ctaagattca gtggcctgcc 75900

acactggtga catttttaaa cctgctagat gtttgtgtag aaaaggattt aaccttgccc 75960

aaagaggggt ctggcctttg tccccagcta ctggacataa tctctttaaa ctcttgaaat 76020

atcattcctg atagaagtat ttttgttttg actaggggcc ttgggccagc cagatagcaa 76080

caatgtgatc tgggttgggg gctttggatc aggtggcatc agtgtgacct cctgagtggc 76140

tagagactag aatcaaccac atgggcagac aacccagctt acatgatgga attccaataa 76200

agactttgga cacaagggct tgggtaagct ttcctggttg gcaatgctct atactgggaa 76260

acccattctg actccatagg gagaggacaa ctggatattc tcatttggta cctccctggg 76320

ctttgcccta tgcatttttc ccttgtctga ttattattat tattatgaga tggaatctcg 76380

ctctgtcacc caggctggag tgcagtggaa tgatctcaac tcactgcaac ctctgcctcc 76440

ccggttcaag cgattttcct gtctcggcct cccgagtagc tgggactaca gatgcatacc 76500

accacacccg gctaattttt ttgtattttt agtagagacg gggtttcacg ttagccagga 76560

tggtctcgat ctcctgacct catgttccgc ctgcctcggc ctctcaaagt gctaggaata 76620

catgtgtgag ccaccgcgcc cagccccctt ggctgattat taaagtgtat ccttgagctg 76680

tagtaaatta taaccgtgaa tataacagct tttagtgagt tttgtgagca cttctagcaa 76740

attatcaaac ctaaggatag ccttggggac ccctgaactt gcagttggtg tcagaaataa 76800

gggtgctcat gtgtgtacca tgccctctaa ttttgtagtt aattaacttt cacaacttta 76860

ttattaccgc ttacactcaa tgtttattca catttatcca cataccactt attctagtgc 76920

cttgcatcaa agactttcta tctcatgtac tttattctgc ttgaagtaaa tcctttagga 76980

tattcttttt ttttttaaaa ctttgcacat acatactttt atttttatt tatttttaat 77040

tttgttattt ttgtgggtac gtagtagata tatgtattta tggagtacat gagatgtttt 77100

gatacaggca tgcaatgtga aataagcaca tcatggagaa tggggtatcc atcctctcaa 77160

gcaatttatc cttcaagtta caaacaatcc aattacactc tttaagttat tttaaaatgt 77220

acatttaatt ttgtattgac tagagtcact ctgttgtgct atcaaatata attttttttt 77280

tttttgagac agagtctcac tcagtggccc agactgaaag tgcagtggca caagctcggc 77340

tcacttcaat ctctgcctcc ctggttcaag cgaatctcct gcctcagcct cccacatagc 77400

tgggattaca ggcacacacc accatgccca gctaattttt atatttttt agtagagacg 77460

ggttttcgcc atgttggcca ggctggtctt gaactcctgg cctcaaatga tctgaccacc 77520

tcagcctccc aaagtgctag gattacaggc atgagccacc acacctggcc aaaatagaat 77580

attctttagt gaggtctgct ggtgacaatt tttttctttt ttttgagact gagtctcgct 77640

gttgtcagct tgggctggag tgcaatagca cgatctcagc tcactgcaac ctccacctcc 77700

cggattccag caattctcct gcctcagcct cccaagtagc tgagagatta caggcaccca 77760

ccaccacacg cggctaattt ttgtattttt agtagaaatg ggggttcacc gtgttggcca 77820

ggctggtctc gaactcctga cctcaggtga tccacccacc ttggcctccc aaagtgctgg 77880

gattacaagc atgagccacc acgcacagcc aatttttcc gtttttgtct gaaatcttat 77940

tttgtgtcat ctttgaaata tatttttgat ggatataaaa ttgttggttg atagttatta 78000

-continued

tcattattat tattattttg agacagggtc tcactctgtt gcctatgctg gggtgtagta 78060

atgtgatctc ggttcactgc agacttgacc tcctagggct caggtgatct tcccacctca 78120

gcctccctag tagctgggac tacagatgca tgccaccata cccaactaat ttttctattt 78180

tttgtagaga tgaggctttg ccacatttcc caggctggtc tctaactcct gagctctagc 78240

aatccaccca ccttggcctt acaaagtgct gggccatgac tagccagcag ttacttttta 78300

tagcatattg aatatttaat atgaatcttc tggcatccac tgtaactgtt taaaaaatca 78360

gctgtttact tggcactctt ttttttttt ttttttttga gacagagtct tgccctgtcg 78420

cccaggctgg agtgcagtgg cgtgatcttg gctcactgca agctctgcct cccgggttca 78480

cgccattctc ctgcctcagc ctccggagta gctgggacta aaggcgcccg ccaccacgcc 78540

cggctgattt ttttgtattt ttcgtagagt tggggtttca ccgtgttagc caggatggtc 78600

tcgatctcct gacctcgtga tctgtccgcc tcggcctccc aaagtgctgg gattataggc 78660

gtgagccacc gcgcccagcc tctttttttt ttttttttag acggagtctt actctgtcat 78720

ctaggctggt gtacagtggc gtgatctcag ctcagtgcaa cctccacctc ctgcctcagc 78780

ctgccaaata gctgggatta caggtgcgta ccatcacgcc cggctaattt ttgtattttc 78840

agtagagatg gggtttcacc atgttagaca ggctggtctc gaactcctgg cctcaagtga 78900

tctgcctgcc ccagcctccc aaagattaca ggcatgagcc accgcacccg gccaagtagc 78960

actcctttga aggtaatctg cttcccctac ccctagcaat ttttaacaat ttttcttcat 79020

ttttatttcc tgaagttttg ttattaataa tctgtgtgca gatttctttg tatttctttt 79080

gtttgcagtt catagtgatt cttgaattag tgtgttggtt tctgttatca ccacaggaaa 79140

attgtcagcc gttagctttt caaatatttc cttgctaaat tctctcttct ccccttccgg 79200

tacaattgat ttgattaaaa ctaaaaccag ggccgggtgc agtgactcat gcctgtaatc 79260

ccaacacttt gagaggctga ggcaggtgga tcacctaagc tcaggagttc aagaccagcc 79320

tggccaatat ggtgaaaccc cgtctctact aaaaatacaa aaattaccag gcatggtggc 79380

acacatttgt agtcaggagg ctgaggcagg agaattgctt gaatccagga ggtggaggtt 79440

gcagtgagct gagatcccac cactgcagtc tggcctgggc gacagagtga gatgagaatc 79500

tgtctcgaaa aaaaaagtta tgaatgtttg ataaactata tttgttagaa tgtttgttgt 79560

agaatactat tcattgattt ttaaacaatg ttagattaaa ccattcactg gatttgtgat 79620

aattaactta ctgattttac ctcactgatt tgttgtaatt aatacaactg gtataaaaag 79680

actgtgacga ggccgggcat ggtggctccc gcctataatc ccagcacttt gggaggctga 79740

ggcaggcgga tcacctgagg tcaggagttc aagaccagcc tgaccaacat ggtgaaaccc 79800

catctttact aaaaatacaa aattagccgg tcgtggtggt gcatgcctgt aatcccagct 79860

cttcgggagg ctgtggcagg agaatcactt gaacccggga ggtggaggtt gcagtgagcc 79920

gatatcgcgc cattgcactc cagcctgggc aacaagagcg aaactccgtc taaaaaaaaa 79980

aaagaaaaaa aacacataaa acaaaacaac actgtgacgg ttcccaaaaa ttaggagcat 80040

aattaaagga actcctgata aaaattaatt ttatcttaca tgtaaactaa aatgacttta 80100

tgaagttaat tcagaaatac aatgcagggt attagtttgc cacagctgcg tattcagcct 80160

aatgtaatat tcttgttatt tttaaattct tcttttaact ttactcatat gtggatcatc 80220

aaatttcaaa agattaaatg acaatactct tagcagcaag cttccctaag catataaaca 80280

-continued

ttttaatggg tgatgattca gaaggtaccc gaagaatatg tactgccaga tatcattcac 80340

ccccatatac ctgcccgaca gacatcccat tttgggaccc tggataaatg tgtgggtgga 80400

gagaaagata ggagaaagtg gtataagcaa atggctttgg agtctgattg acagcgattg 80460

aaatcctgtc tctacctctt aacagcctca tgatcctaca taagttaccc cgatcctcag 80520

ggccacatct gtaaattggg ggttgcgatg gcagccatct cacagggtct cttttcgggg 80580

aagggcagga attatggatt aagtgagcta gtaattgtaa agcacttaat acaaggaggg 80640

cgcataataa gtacttcata aataatgacg gccattatca tgactgaggt gtatgcagct 80700

gtcggggatt acggcgactt cagaatttct ggtgggcagg gctcaaaggc agcaaatcac 80760

actggaagtc gaggtgaggc actgcttctg cacagactgc ttagctggag agaatgagga 80820

aggcttagag gagatttaga ggaacttaga gtcctccgcc tccaactctg tgggatctgc 80880

tcccgtgcca gagacattca ggggatttct cgcactctcc cctcccctac gtccctcccg 80940

ccccatccaa ctaaccacac aacacataca aaatagcccc tgcgaggttc tgcacgctgg 81000

aagggaacag gagaagggcg ctgcgctttc ttgctgatgc cctgtacttg ggcccctggt 81060

agacacagcc acttgtcccc tcagcctgca gagaaatccc acgtagaccg cgcccgggtc 81120

cttggcttca gccaatctcc ctttggtggg ggtgggatgc acgatccaag gttttattgg 81180

ctacagacag cggggtgtgg tccgccaaga acacagattg gctcccgagg gcatctcgga 81240

tccctggtgg ggcgccgctc agcctcccgg tgcaggcccg gccgaggcca ggaggaagcg 81300

gccagaccgc gtccattcgg cgccagctca ctccggacgt ccggagcctc tgccagcgct 81360

gcttccgtcc agtgcgcctg gacgcgctgt ccttaactgg agaaaggctt caccttgaaa 81420

tccaggcttc atccctagtt agcgtgtgac cttgagcagt tgactttatt tttcagtgcc 81480

tagttttcca gataccagga ctgactccaa ggactattac tcatctggag ggtttagcac 81540

agtaccgtcg catagtaaat ttccatgtca gttttggtta cctttcatgc acttgcaaac 81600

atgccatgct ctgaaacgaa ataggcacat ctttttttct ttttttttta aggagtcttc 81660

ctctcgccca ggctggagtg cagtggcgcg atcttggctc actgcaacct ccacctcccg 81720

tgttcgagat tctcctgcct cagcctcctg attagctggg actacaggca tgccacgacg 81780

cccagttaat ttttgtattt ttagtagaga cggggtttcg ccatcttggc caggctggtc 81840

taactcctga cctcaggtga tctgactgcc tcagcctctc aaagtgttgg gattacaggc 81900

ataagccact gcatctggcc agaaatgaaa taagtaaatc ttttaacctg ctctaacaat 81960

atagtgaaaa gaccatatta ttattagagc aggttaaggg atttgcctat ttcgggttct 82020

agttatagtc ttaaacttgg acattcttgt agaaagtaaa aagtttcctc ttcaaagttc 82080

cccttcttgt taaagaatac atcataagtg ttagaagtaa tagtttattt taaagactaa 82140

ctttcttcaa gcctccttgc tttgtgctaa taactctttg ttaagcccta tcctatgtaa 82200

ctgttggaca tgctcacagg cacgttccag ttcacagcct atgccccttc cttatttgga 82260

aatgttattg cttccttaaa cctttcggta agcaacttcc tctccttctt cgttcttcct 82320

tgcacttacc tatttagaaa gttttaggct attagcaaat cggctatcag tttaagagtg 82380

tgaggtcccg ctccagccaa tggatgcagg acatagcagt gaggacgacc caaatgcgta 82440

agggataaat atgtttgctt ttcctttgtt caggtgtgct ctcgacatcg ttccatctgc 82500

gattgagcac cctttctgca gaaagtaaag attgccttgc tggagatctt ttgtctccgt 82560

-continued

gctgactttt cttcgtggca ccgattatct atttctaaca attttggtat ttctaacatt 82620

ctgaacaatc ttgggctagt tgtctcttct gggcctgttt ccccatccgt cacatgataa 82680

acttcattgg tttaaaaacc ccagcgaaca tttattgagt tactattacc ttcctgccct 82740

ccccaacccc aaccccaggg agcagttaca acctcagccg ctgagcgcac tcgccgggtg 82800

ttaagaagca ccaaagacag ggaggcttga ttgattttgc tttgggagta gagggtcaga 82860

agattcacag gaaaatggca tttgagcaag gatgattcac tggagctagc ttttaaatac 82920

tggcgaggct tttatgttgc agtcccttac aaagttgagc attcgcaggg actgcactcc 82980

gaaataagcc cgcttccccc tttcattcgc taatgatcca gggagctgct ggttccgcat 83040

gcggcaggtt gtgccttttc ctaatcaggg ttctgcatcg cctcgaaccc gcaggccgtg 83100

gcgggttctc ctgaggaagc agggactggg gtgcagggtg aagctgctcg tgccggccag 83160

cgcctgtgag caaaactcaa acggaggagc aggaggggtc gagctggagc gtggcagggt 83220

tgaccctgcc ttttagaagg gcacaatttg aagggtaccc aggggccgga agccggggac 83280

ctaaggcccg ccccgttcca gctgctggga gggctcccgc cccagggagt tagttttgca 83340

gagactgggt ctgcagcgct ccaccggggg ccggcgacag acgccacaaa acagctgcag 83400

gaacggtggc tcgctccagg cacccagggc ccgggaaaga ggcgcgggta gcacgcgcgg 83460

gtcacgtggg cgatgcgggc gtgcgccccc gcacccgcgg gaggggggatg gggaaaaggg 83520

gcggggccgg cgcttgacct cccgtgaagc ctagcgcggg gaaggaccgg aactccgggc 83580

gggcggcttg ttgataatat ggcggctgga gctgcctggg catcccgagg aggcggtggg 83640

gcccactccc ggaagaaggg tccctttccg cgctagtgca gcggcccctc tggacccgga 83700

agtccgggcc ggttgctgaa tgaggggagc cgggccctcc ccgcgccagt ccccccgcac 83760

cctccgtccc gacccgggcc ccgccatgtc cttcttccgg cggaaaggta gctgaggggg 83820

cgccggcggg gagtcaggcc gggcctcagg ggcggcggtg gggcaggtgg gcctgcgagg 83880

gctttcccca aggcggcagc aaggccttca gcgagcctcg acctcggcgc agatgccccc 83940

tgagtgcctt gctctgctcc gggactcttc tgggagggag aaggtggcct tcttgcgcga 84000

ggtcagagga gtattgtcgc gctggttcag aagcgattgc taaagcccat agaagttcct 84060

gcctgtttgg ttaagaacag ttcttaggtg ggggttagtt tttttgtgtt tctttgagga 84120

ccgtggatca agatcaagga aatctcttta gaaccttatt atggaagtct gaagtttcca 84180

aatgttgagg gttttatgtc taaaagcaac acgtgaaaaa attgttttct tcacccagtg 84240

ctgtcttcca atttcctctt tgggggggagg ggtagttact gctgttacta aaataaaatt 84300

acttattgct aaagttcccc aacaggaaga ccactacttt tgatgacttt ggcaagtttg 84360

ctaactactg gaaccctaac ttacaaacga actacttaca tttttgattt ccagttgtat 84420

tacctgccca atgtttacgt agaaacagct taattttgat tctgggtaac gttgttgcac 84480

ttcattaaaa atacatatcc gaagtgagca agtatgggtc tgtggacagc agtgattttt 84540

cctgtcaatt cctgttgctt cagataaaat gtaccagaca gaggccgggc gcggtggctc 84600

acgcctgtaa tcccagcact ttgggaggct tggcgggtgg atcacctgag atcgggagtt 84660

caagaccagc ctgaccaaca tggagaaacc ccgtgtctac taaaaatacа aaattagcca 84720

gggtggtggc gcatgcctgt aatgccagct acttgggagg ctgaagcagg agaatcgctt 84780

gaacctggga ggcggaggtt gcggtgagcc gagatagcac cattgcactc cagcctgggc 84840

-continued

aaaaagagcg aaactccgtc tcaaaaaaaa agtaccagac agaaatgggt tttgttttct 84900

ttttttgttt tgagacggag tttcgctctt gttgcccagg ctcgagtgca atggcgcgat 84960

ctcagtctcg gctcactgca acctctgtct cccaggttta atcgattctc ctgcctcagc 85020

ctcccaagta gctgggatta cccatgcccc accatgcccg gctaattttt gtatttttag 85080

tagaaacggg gcttcaccat gttaggctgg tcttgaaccc ctgacctcaa gtgggcctcc 85140

cacctcggcc tcccaaagtg ccaggattac aggcatgagc caccgcggcc agccagaaat 85200

gggttttgga aaaagcacta aacaaaatcg aacttggttt catatgacag ctctgctgct 85260

aactgtaaca ggggcagacc agttaaccta cttttctgtc ttctgtcagc tgagaattag 85320

atgattccca aaggcccatt gaactctgaa tgactttaaa tacttcttct taagtgggta 85380

cacggttttg gtaactgatg ccaggtgatg aatgcatgaa agtgcttaat gaatgaaacc 85440

ggtaaaatag taggaggaag ctttattggt aaggcagggg tatacctaat agctctctaa 85500

tttattggta ttgaagtggt taacttttgt ttttttaagg ggggaaaaca ttctaagaat 85560

aatgaggcaa actgcatatt gcacaagaga ctgttgtctc tattcaacaa atacctttg 85620

agtgtccaga gtctgccagg tgctgtgcta ggccctcacg attgagtagt gaaccagaga 85680

atgtccctgc acccatggag cttattgtct actggggtag acagataata aataagcaaa 85740

caaatcttct ctcttctccc tttcgctcca tgtaagtgtg tgtgtatagg tgtatactta 85800

caagttgagt aaagtgttat gaaagattaa gaggagaaat gcattttggt tagatgttag 85860

aggactcagc aggtgacctt gaaacttaga gctgaaggat cagtaggagg taactagaga 85920

ggccagggaa tcgcatgttc aaaggccagg aggcaagaaa gagcatggtg cccttcaaga 85980

gaggaaagaa ggctactgtg actggagcat agatgtaggc aagtgttggg tgattgagag 86040

ctctacgggc catggttagg ttttattcct aatgccgaga tgccaaacat ggtggttcat 86100

atctgtaatc ccagtatttt aggaggccga ggcaggaata tagcttgaac ccaggagttc 86160

aagaccagcc tgagcaacat gagacctgta caaaacattt aaaaaattgc tgggtatgat 86220

ggtgcacacc tgtggtccca gctactcagg aggctgaggc agaaggatca cttgagccta 86280

ggaggtggag gctacaatga gccatatttg agtcactaca ctccagcctg gatgacaaag 86340

tgagaccatg tgtcaaacaa aatacagaaa gaatattaat ttaaaatttt gaaagaggag 86400

tgatctgaac ttatatctta aaaagatcat tctagggcat ggtggctcat gcctgtaatc 86460

aagggctttg ggaggctgag acaggaggat cacctgaggc cagttcgaga tcaacctgta 86520

cagcatagag agactccatc tctacaaaaa gaaaaaataa atagctgggt gttgtgagtt 86580

attcaggagg ctgaagcaga aagatcactt gagcccagga gtttgaggct gcagtaagct 86640

atgatcccac cactgcaaca cagtgagatc ttgtctcaaa aaaaaaaaaa aatcattcta 86700

ggtgcttttt ggaggctgga tgtggtaaga gtagaagctg gagatggtcc tgttagggat 86760

tcgattcaga ctttaaatac catcaatgca ttgagtccca aatttacatc actacgttgg 86820

atccttgccc ctgaatccag actggtatat ccaactttag gttcagtttg tatctctacc 86880

tgaccaatat agaggtgtcc agtcttttgg cttccctagg ccacattgga agaagaattg 86940

tcttgagcca cacatagagt acactaacgc taacaatagc agatgagcta aaaaaaaatc 87000

gcaaaactta taatgtttta agaaagttta cgaatttgtg ttgggcacat tcagagccat 87060

cctgggccgc gggatggaca agcttaatcc agtagatacc ttcaacttac aatatctaaa 87120

-continued

attttatgcc agatttagtc attttaaacc tgctcatcag tttttctcaa gaagtagtat 87180

tttggctttt tttcttttct ttttttgag atggagtttc gctcttatcg ttcaagctgg 87240

agtgcagtgg cggatcttgg ctcactgcaa cctccgcctc ctgggttcaa gtgattctcc 87300

tgcctcagcc tcgcaagtag ctggaattac aggcatgcgc caccatgacc agctaatttt 87360

tggagacagg gtttcaccat gttggtcagg ctggttttgt actcctgacc tcaggtgatc 87420

tgcctgcctc ggcctcccaa aggctgggat tacaggcatg agccaccgct cccggctgca 87480

tttttggatt tttagttgct cagcccaaaa ctttagtaca tctttgaacc tcttctttcc 87540

tcctactcta tatctgatcc atcagcaaat ctgttaggtc tacctcacac atatcgaaat 87600

cctaccacgt ctcaccatct gtgacaatta acaccctggt ctaggcagtc atctctgtta 87660

agattgagtg gttaaggatg tcctctaagg agatgacatt caaatcttag cttaaatgtc 87720

aagagggagc tggttttata aagattgagg aggcagcatt attttgccat aggcttccat 87780

ttggtttcca ttccattctt gatacttatg gtatatattc aaaacaaatg cacagaaaca 87840

gacccaggta tattgggaat ttcggatata gagttcctag ttgggaaaag atagactgat 87900

ctgtaaatga tgctagttat ccatcatctg gcaaaaaata atttcctgcc tcctctcata 87960

tatctcagat caacagactt tttctgttaa gggccaaatc ataaatattt taggctttcc 88020

agaccatatg gtttctgtca cactctcctt tatccttgaa gccatagaca atatgtaaac 88080

aaatgggcat ggctgtgcta cgataaaact ttacttacaa aaactggtag tgggccagtt 88140

taggcatggc cagcactttg ggaggctaag gcagatggat cacttggggt caggagtttg 88200

agaccagcct ggccaacatg gtgaaaccct gtctctacta aaaatacaaa aaatagctgg 88260

gcatggtggt gggtgtctat aattccagct actctggagg ctaagacaca agaatcactt 88320

gaacccagga ggcagaggtt gcagtgagct gagatagcac cactgcactc cagccagggt 88380

gacggagtct taaagcaaaa caaaacaaaa ggtagtgggt tgtatttggc ccatgggctg 88440

tagtttgcca atccctgatg cagaaacaaa ttccaggtaa ataagagcct ggaatgttaa 88500

aaaaacaaaa cttgaagtca tgtagaagaa caggtagggg gaacaatcct gatctcagga 88560

taggaaggga tattgcttaa aataagacac aggaaaatat aatccatgtt gtgtaaattt 88620

gactacgtta aaacttaaaa ctttcgccaa gcgcggtggc tcacgcctgt aataccagta 88680

ctttgggagg ccgaggtgag cagatcacca ggtcaggaga ttgagaccat cctggctaac 88740

acggtgaaac cccgtctcta ctaaaaatac aaaacattag ccgggcgtgg tggcgggcgc 88800

ctgtagtccc agctacttgg gaggctgagg caggagaatg gcctgaaccc gggaggcgaa 88860

gcttgcagtg agctgagatc gcgccactgc actccagcct gggcgacaga gtgagattcc 88920

gtctcaaaaa aacaaaacaa aacaaagcaa aaaacctaaa actttcatac aataaagtat 88980

acctaagata cttctagaag agaagattta catccaggac gtgtatggaa tttctgcaag 89040

taataagtaa aagacaaggg acatgaagag gcagttcaca aaagaggaag ccaaaatgac 89100

caataaacat gaaaggatgt ttaacctcaa aggaaacaag gaaatgaatt aaaaacatca 89160

aatgccattt caaaactagt aagttggcaa aattaaaaat accaaggatg agaatatgaa 89220

gcatggctat atgagtgcat ggaatggtac agtcactttc attaaaaatg cacataattt 89280

gtttttttatt tatttttttg agacagtcta tgtcgcccag gctagaatgc agtggcatga 89340

tctcggctca ccacaatctc tgcctcctgg gttcaagcaa ttctcctgcc tcagcctcct 89400

-continued

gagtagctgg gattacaggc acatgccaca acgcccggtt aagttttgta tttttagtag 89460

agacagggtt ttgccatgtt ggccaggctg gtctcgaact cctgacctca ggtgagctgc 89520

ttcccaaagt gctgggatta gaggcgtgag ccaatgctcc tggctgaaaa aaatgcacat 89580

aatttgttac ctagcaattc catgtctaga ggcttatcct agagaaattc ttgcttatat 89640

gcataggaag acgtgtacta gaatgttcac tagttgaatg tttaagtgaa aattaggaaa 89700

taaagtaaat gttcattaac aggaaaatga gtaaaggtat atttataaaa caattaagta 89760

gctaaaatga ataaactaga gctgcgtgaa tgaactagaa ctggttcaat agtcatgtca 89820

gattattgaa tgaatacagg tcagatatgt atagagtgtc atttgtgtaa ttaatttttt 89880

ttttttttt gagatggagt ctcactctgt tgcccaggct ggagtgcagt ggcgtgatct 89940

cagctcactg caacctccac ctcctgggtt aaagtgattc tcctgcctca gcctcccgag 90000

tagttgggat tacaggcatg caccaccatg cccagctcat tttcctattt ttagtggcca 90060

cagggtttca ccatgttggc caggctggtc ttgaactcct gacctcaagt gttccaccca 90120

acttggcctc ccaaagtgct aggattacag gcgtgagcca ccgtgctcag ccatttgcgt 90180

gatttttaaa gatgtgcaga ataatgccat taaaaaaaat acacatacat gtatatatat 90240

acacgtttgg ctgggtgtgg tggctcacac ctgtaatccc agcactttgg gaggctgagg 90300

caggaggatc acttgagccc aggtgtacaa gactagcctg ggcgagatag caagacccca 90360

tctcaacaac agaaaggata attaggtatg gtggcatgag aggatcactt gagcccagga 90420

gttcgagtgt tatcaggcca ctgcactcta gcctggacaa caaagcaaga ccgtgtctca 90480

aaaaaataaa aataaaaagt atttgtatgt ggtcatagtc aaaaaacgta catggaagga 90540

aaatgtcttt atttatttat ttatttttt ttttttaaga cagagtcttg ctctgtcacc 90600

caggctgggg tacagtggtg taatctcagc tcaccgcaat ctcggcctcc cgggttcaag 90660

cgattcttct gcctcagcct tctaagtagc tgggactaca ggtacccgcc accacaccct 90720

gctaattctt gtgttttcag tagagacagg gtttcaccat gttggcaagg ctggtctcga 90780

actcctgacc ttaagtgagc cacccgcctt ggcctcccaa agtcctggga ttacaggtgt 90840

gagccactgc gcttggccag gaaatatcta atttagtaag tatttatatc tgggaaagga 90900

agggtcaggt ggtgattcat aggaactcta aagtctatgt ataatactta gggggacaga 90960

aggaaataaa gcaaaatgct gatatttgat tgttgagttg tgtatatgtt agaagtataa 91020

cataggagat ctgattgata gtaggagaat gtttttaggt ggtaaaagtg gaaccgtggt 91080

ggtttgtttt ggcagtagaa tcagttggtc atagtttgta tgtggaaggt aataaacaga 91140

ccatgttaag gatgacttcc ggaattttgg tctgagtagt gggtggatga cagtgtcatt 91200

catgagggaa gatgaagact gaggtaggaa caggtttggg agaagatgac atgttccctt 91260

ttagacaagt ggaattatgg aagatggcag gtaggtggtt agctatatga atttgagata 91320

aaagatttag gatggagata taaatttagg agtaacagcg tatctatggt attgtaagcc 91380

ttaagaatgg gtaggatcag ccaggaaata cagatgtata tgcagaagag aggagtcaag 91440

gaagccaaga caagttaatg tttaaagtga gtgatgtagt ccatgggcag atgctgctga 91500

gagggctgca aacaccagtg accctacaac atttttaaat gtcgtcttcc tgacagcagt 91560

gatcagtacc tgcaacgatc ttatttattt ttttcatgtt agtctccaca cacttgaatg 91620

tagacttttt gaaggcaaaa tcattgcctt ttctgagctg ggagcatgtc tggcacatac 91680

-continued

caagcactca acagttgatg tattgacttc atccagatac tctgagggcg agttatttcc 91740

tgctactagc ctttcacctt tcaatgttta agagcacaaa tacagagatg ggcacgtttt 91800

ggcatttctt attttgataa ccttttcctg gtaagatttt ttaatgttga aaaaaaaaaa 91860

caagaaaaga gggttaaaaa tagtcttatg tcagatcctg tgatagaatt cacacttggc 91920

ttaagctgct gggcaccttc ctatcttgga tgtcatatta gcttatctac agcagaattt 91980

ttactgtttt atgtagtaag gaagcaatta tatgattatt ttacagacaa attattcttt 92040

atcttttatt tttttagacg gagtctctct ttgtctccca ggctggagta cagtgtcgcg 92100

atctcggctc actgcaacct ccgcctcctg ggttcaagca attctctgcc tcagcctccc 92160

aagtagctgg gcttacaggt gtccgccacc acacccagct cattgttttg tatttttagt 92220

agagatgggg tttcaccatg ttggccaggc tggtcttgag ctactgacct caggtgatcc 92280

acccgccttg gcatcccaaa gtgctggaat tacaggcgtg agccaccgtg cctggcccag 92340

acaaattatt atactctgag tgttagaggc ttaggatgtt ttcacttgat gctatgggag 92400

gaataagtaa taagatatga tacacaacca aagacctttc ttcactatgc ttctagtagc 92460

tagtactatg gatgacacat ggtaataata ttggttagca tttgtcctca atttactgtg 92520

ctagttactc ttctaagccc cttacaggta tatatttttt ttcatcaata atcctctaag 92580

gtagttttta ttattgacct aattttataa atcaagaaaa ttaagaccca gagaagtaag 92640

taacttgtcc aagatcacat ggcttataag tggtagagcc agaatttgac cccagatgtt 92700

gtgactacat tgtctctcca taagcaggtt caactctttt gactggatgc tgttccaagg 92760

tcacttcctt agagaagcct ttgctgacaa ctaccctcct gtgccctcct ccaaggctgt 92820

ccattgttct agaactttga atactcatct tagaataaag ctggtctaat ttttacagtg 92880

ttatagaatg gatctctgac tgcaaaagtt ggtcataatt atctttttat gttctagtga 92940

aaggcaaaga acaagagaag acctcagatg tgaagtccat taaaggtaag ttctgccctt 93000

ggcagtccac tgcattaaaa agtgatgtgc tttgcatttg tgagttcttt aatcctgtta 93060

tactctctct tttggcatta atcatttctg ccttatttta taattactta tgattttgat 93120

ttatttccct ctttaacctg tataatgctt taacatctag catataataa gtaggctttt 93180

ttttttttct ttttttggga gacggagtct tgctctgtta cccaggctgg agtgcagtgg 93240

cgcgatcttg gctcactgca agctctgtct cccgggttca caccattctc ctgcctcagc 93300

ctccccagca gctgggacta caggtgcacg gcgccacgcc tggctaattt tttgtatttt 93360

ttagtagaga cagagtttca ccatgttagc cagtatggtc tcgatctcct gaccttgtga 93420

tccgcccgcc tcggcctccc aaagtgctgg gattacaagc gtgagccacc gcacccggcc 93480

gtaagtaggc ttttttacc ttaattttat tttttgaga tggagtcttg ctcttatccc 93540

caggctggag tgcagtggtg ccatctcggc tcactgcagc atccacctcc cgggttcaag 93600

cgattctcct gcctcagcct cccgagtagc tgggattaca ggtggccgcc accatgccca 93660

gctaattttt gtatttttag tagagacagg gtttcaccgt gttggccagg ccagtctcaa 93720

actcctgacc tcaagtgatc cactcgcctt ggcctcccaa agtcctggga ttacaggcgt 93780

gagccaccat gcctggccat aagtaggctt ttactgagcc ttgtgtgtat tggctatcct 93840

agtgattaca gtgaaccagt gcccttctta ttaatcacac atttaattgt tccctaaaag 93900

tgattagttc actttattta tttagtaaga caaaaaatga agaatactct taactgagca 93960

-continued

gtctgttaac tgtaggaaag cactgacact tataaggctt agttttctgt catttatcca 94020

gaagtatggt tgattacagt ttttactttt ttatttgaat gaacaacctt aatttaaaat 94080

atattttgtt tatttttgt tgggatcgat acattgtcct tgtttataga ttagagcatg 94140

ctttttaaag atgctgtatt actcactgat tttatttgtc cagtgtacag agattgaagt 94200

gggaaaatta taatggaaat tgtttccata gtcattacat attaatttca tcaatttatt 94260

tccataaaat ctgtagattg ctacttattt agatttttcc ttcaaatgtt tttatgttgt 94320

attgcttgca ctgagtattt attctatatg ctcaatttgc tggagaagaa gactaattat 94380

aacttaggca agttgtaaaa ttagggaaaa aagtaaggta ccttacagcc tagtttactt 94440

atttcttatg taaagccagt tagattccac attagttcaa actgccttct ttgagcaaaa 94500

cttgattggc agtgataaag gcttaaagcc cttctcaagc agagacctgt aaagactaga 94560

tctgactgta gtagaaggaa ggaacttaga tgtttcaggc agtgagaaca ccagtcttcc 94620

actctaaact ttgccactaa cagtatgacc ttgggaagtt gtaactttct tcagattctt 94680

catttgttga atgggggat tggcctagct aatttctaaa tctctactgg gctaaaaaat 94740

tctgtgctta tactctgatt atgaagtaca taatctgtgc ttaacattca ctgacttatc 94800

cttaggataa tacagaagca gtacaagaaa cagcccctca agatgtttgc agtctggtta 94860

gaaagacaaa cttatacaca gaacagtagc aaatagacca aaataataat agctgccatt 94920

tatagaacac ttcttctgtt ctgggcatta gacaaaaact gactataacg gtgaacaaaa 94980

aagacttagg tcctgccctc attgaactta cagattagta ggggagagga acattaatca 95040

agtaattcca cagatggctt agcctagatt ggtagtgatg gaagtaaaga gatgtgaacg 95100

gacttgaaaa aaaattcgga ggcaaaatgg atagaagttt attattgatt aaatatgagg 95160

tgtgagagag agggatattt aagattgata cctaccttct ggcttgccta acagaaccaa 95220

aacaggaaat tatatgttca gttttgttat gttgggtggg aggtgctttt gagtcattca 95280

tttatatatg ttatatatgt tattttatat gcatagtaat tttaaggtct gagttttaaa 95340

ccaaaggtta gagagtgatt ttttagagtc tagcaaacct aagttgaaat cctgcctgtt 95400

gaaatggctg tttactagct cattaaccta gggcaaagta ttcaacttgt tttcattttt 95460

gtcttcatct ctaaaatgag gaaaatatgg tcttacaaga ttgtcctgag agatagatga 95520

aataatatcc aaaaaaaaaa aaggtacata gagaaactcg tatagtgcct ggtatatagt 95580

aggtcctcca ttggtagcta tcattatcta gttttaacat agccttcagt ttgttgaatt 95640

agtcaaactg agtgaagcac tgcaaggaat tcagaggaat ttgagatcaa caaatgattt 95700

ctgaagttta gggaagactt catggcaatg acacttacct tgtataaaag ttgaagaata 95760

agaaagattt gaatgagaga ttctttctct tctccctacc agcccagctt cttatttgag 95820

gatatattgg gcaaaggggc cttcagacaa gtagagggag atttttacag aaagattgag 95880

atgaaggtat agaaggctgt aaagaccaga aaagagaatt gagacagagg aagcaggaag 95940

ccactgtagg tttttgagca agatattgat gctgtaagta tggtgtttat gaaaggttag 96000

tctggaagag atttgcagga tggagacccc ggaagttttt ttgttataat acagaaagac 96060

ttgcactgag ggtgaggtgt taaaaataaa caggtaagta aatgtttaaa catcttgaag 96120

gaaaagtcaa caaatcttgg caagtaaaca gataacagtg aaaaagaatg ggaccaagat 96180

tttgagtttt ggagactggt ggattgaaca gacagggaaa ttgagaggag aatcagatga 96240

-continued

tgatgtttta agttgatatt tagacagatt gtgcttgaga tggtaaagtc aatgtgggtg 96300

ggaatgctta gtagcgagta atcagtgata caagaccaaa gcccaggtca aagacaagtc 96360

acagatacag atcagggctt tttcatctgc tccacagagg tgtaccctag gagctgttgc 96420

aaacagtcca tgtggagggt gtgagtaaga tgtttccctt gaatttgcca gaattacttt 96480

tttgttgttg ttgttgtttt ttctgagaca gattctcgct ctgttgccca ggctggaggg 96540

cagtggcgag atcgcgcagc tcactgcaac ctctgcctct cgggttcgag tgattctcct 96600

gcctcagcct cccaagtagc tgggattaca ggcttgtgcc accaagccca gctaatttct 96660

tttgtatttt tagtagagat ggggtttcac catgttggcc agactggtct cgaactcctg 96720

gcctcgtgat ctgcctgcct cagcctccaa aagttctggg attacaggcg tgaaccactg 96780

cacccggtcc cttgttaagt ttattttggt gggaagcaaa ggaggtttca gcttttaaaa 96840

agtttgaaaa ttattgctct ggtaataatt aaagatttga gagtaaatat gctttctagc 96900

agaaagaata aaagaagaac agatagcctc aagaagggga gccaaagaag caggctatat 96960

ctgacacact gggtgttgat aaatgggtat taaaagaatg agagcaatga gcagatagaa 97020

gaggaaatta ggagagtata ataccatgga gaccaagaaa gatagactat caggaaggag 97080

tggtaaaaat aagttactag ttctaagaga gatgttaaga gggaccgggg aaagccttgt 97140

acaaatgagt tagtagcatt ttacattata tacatctaat taagaaacaa tgcgagagtc 97200

tcaccattcc tatagactct tacttgtact tgtctgaaca cgaaaactgg cttttgttta 97260

taaataagct aaaaattatt ttgctccaat ttctcatgaa aataaaaata aaccttcttt 97320

taacattgaa aaaatagttt gaagacagtc actcttcatt ttgtaattcc cacaactatt 97380

attgaatgac tgaaattatc tttattctga agccaaaggg gtgatactga tatttcttca 97440

gactactaaa aatatatttt atgaattttt agtgtgcttt atctttttt gttttttttt 97500

ttgagatgga gtttcactcc cgttgctcag gctggagggc agtggtgcaa tctcagctca 97560

ctgcaacctt cgcctcccag attcaagcaa ttctcctgcc tcggtctccc aagtagctgg 97620

gattacaggc acctgccccc acacccagct aatttttttgt atttttagta gagacagggt 97680

ttcaccatgt tggtcaggct ggtcttgaac tcctgacctc aggtgatcca cccaccttgg 97740

cctcccaaag tactgcgatt gcaggcatga gccaccatgc ctggcctgag gaatatttttt 97800

ctaggttccc cccaccccaa gcatttattc tgcaatttta gttttgttcc taaagcaagc 97860

aaggtttaag gatttaaaaa taatccgtat tttagaatgc tttctggctt tgttactttt 97920

tatccacagt agaagttctc agagaatgat ctccctcttt taatttaact ttttggcaca 97980

gtattttgag aattataaat aatattagaa tgttttctgg ctgggtgtgg tggctcatgc 98040

ctgtaatcct ggctacttgg gaggctgagg caggagaatc acttgaacat gggaggcaga 98100

ggttgcagtg agccgaggtc atgccactgc actccagcct gggtgacaga gcaagactct 98160

gtctgggaaa aaaaaaaaaa aaaaaaagag tgttttcttt cctattttcc accacttgat 98220

taagttactt ttcctcttaa gtatttttttg ctgagtatgc tgacttaaga gtaatgttac 98280

aaaatttaat ttttaaagtt ctctgaaagc ccctttatga gagttttagg ctatcaaatt 98340

gtgtttaatt cttaacaatt ttttgaaaaa ttatagcttc aatatccgta cattccccac 98400

aaaaaagcac taaaaatcat gccttgctgg aggctgcagg accaagtcat gttgcaatca 98460

atgccatttc tgccaacatg gactcctttt caagtagcag gacagccaca cttaagaagc 98520

-continued

agccaagcca catggaggcc gctcattttg gtgacctggg taagtaacta tcatttttta 98580

ttaacttgta ttagaaggat ttgagtacaa tatgtgaaac ttctgtcata ggatacagaa 98640

ctatataatt ggaaagtgct ttggaaaaaa tgtatttaaa ataacagcta caagtataat 98700

gggtagctgt gttgtgttcc tgtaaatata gaatataaag catgcccagt agaaaaacaa 98760

gcatttccag aagaaatata tctgatcact aaatataaat atatgaaaaa gatgtctcac 98820

tttattactg agggaagtgc aaattaaaat aatcagttaa tgttctccta acacattagc 98880

atatttttta aagtttgaca atttgaatgt cagtgaagat gcagggaaat acccctccta 98940

tttagtgata atataatctg gtgaagactc tttggaaagc aatttggaaa tcagtataaa 99000

atatgcatgt catttaggcc actctttcta agacctagcc ctcagatatg ctcattcata 99060

tgtgcaggtg tgtatgtgtg tgtgtgtgtg tgtgtgtgtg tgtatatgta tgtatgtatg 99120

tatgtatgta tgtatgttga aggctattca ttatagtatt gtttgtgata gcaaaaaatt 99180

atggacaaca tataaatatc tgttataggg aaataaccaa attgtggtat acgcatgctc 99240

tggagtataa tatagccatt tgtttctatt tatttatttt cttgagacag ggttttactc 99300

tgttgcccag gctggagtgc agtggtatga tcatggttca ctgcagcctt cacctcctgg 99360

gcacaagcca ttctctcgcc tcagcctcca gagttactag gactgcaggc atgtgtcacc 99420

acacccagat aatttttaa ttttttgtag agacagggtc tcactatgtt gcctaagctg 99480

gtctcaaact cctggcctca agcaattctc ccacacaggc ctcccaaagt gctgggatta 99540

ccaacgtgaa ccaccacacc tggttcagtg tagccattta gaaatctaaa aaagacgtgg 99600

gaaaatgtct aaggcatgtt taaatgtgag aaaagcaagt cacagtatgc atggtaaaat 99660

ccgttatatt aaaataagtt cttccaaaac aaaaacatat gcaggagacc tttattttgt 99720

cagtatttct tacccaaatt tctgcactta gaaaattgca tgtcatgttg tcataagttg 99780

aaaaaaagat ccatgaacca atggacttct aataaaatca gtcctgcttt tgacatctct 99840

ctctactttt gtgtatattc aaaccagagt gtcaatgtgt ttgtggggca cacttagcaa 99900

taatacatag cagacaaaat gcatatagct cagagagtaa aattgtaagt tttgctagat 99960

cactcataaa ttgctgatga gaatttaaaa tggtgcagat gctctggaaa acaggcagtt 100020

tctttctttc ttttttttct tcttttgag acagggtctc actctgttgc gcaggctgga 100080

gtacagtggc gtgattacaa ctcactgcag cctcaccctc ctcaggttca ggtgatcctc 100140

cctcagtctc ctgagtagct gggactatag gcatgcacca ccacgcctgg ctaatttttg 100200

tatttttttt ttttttttct gtagagacgg ggtttcgcca tgtttcccag gctggtctca 100260

aactcctgga atcaagcgat ccacttgcgt aggcctccca aagtgctggg attacgggcg 100320

tgagctactg tgcctggcct aggcagtttg tttgtttgtt tgtttgtttg tttatttatt 100380

tgtagacgga gtctcacagg ctggagtgca gtggcccaat ttttggctca ctgcaacctc 100440

cgcctcccag gttcaagcta ttctcctgcc tcagcctcct gagtagctgg gatgacaggt 100500

gcctgccata atgcctggct gatttttgta tatttagtag atatggggtt tcaccatgtt 100560

ggtcaggctg gttttgaact cctgacctca ggtgatcagc ccgcctcggc ctcccaaagt 100620

gctgggatta caggcatgag ccgtcatccc tggctggtgg tttcttatga cgtgaaacat 100680

gcaattacca tatgacctag cagttgcact ctgtatttat cccagataaa tgaaaactta 100740

ccttccaata aaaacctgtg cacaaatgtt catagcagct taatattgaa aaactggatg 100800

-continued

ttcttcagca ggtgaatgaa ctggttcatt cataccatgg aataccattc agcaataaaa 100860

aggaacaaac tgttgataca tttaaccacc tggatgaata tcaagggaat tatgctgtca 100920

gacaaaaacc agtccctaaa gactacatat agtatgattc cgtttggata atattcttga 100980

aatagagaaa ttaagagaaa tgaaaagatt agtgtttgcc agatgttaga gacagggagg 101040

tgagaggggt aagtgggtgt agttataaaa gtgcaacatg agggatcttt gtgatgttga 101100

agttgtatct tggcagtgga tgcagaaatc tcaatgtgat aaaattacaa agaactaaaa 101160

acaagaatga gtatagataa aactggggaa atctgaacaa gttagagtgt tgtatcactg 101220

tcagtatctt agagtgatat tgtactatag ctttgcaaga tgttaccatg ggagaaacta 101280

aagtgtacaa gggatctcta ggtattatta tttttttaga gatggggttt cactatgttc 101340

cccaggccgg tcttgaactc ctgggctcta gtgatccgcc tgccccagcc tcctaaagta 101400

ctggaattac aggcgtgagc gaccatgcct ggccctttca gtattgtatc ttagaacttc 101460

atgtgaatct agcattatct catagaattt aattaaaaga aattgtaaac ctcacagaag 101520

atcagaattt cctcaagttt gtgatgttga caaagatgaa ctagttgaca ctgacagtaa 101580

gactgaggat gaagacacga cgtgcttcaa aaaaatgatt tgaatatcaa tggattaaga 101640

agaactcttt tgacaaattg atgaaaccct cagtcagttt tataagaatg cccatcttta 101700

tgatcatgct atgaaagcca atttttaaaa aaatttttg tctttcctaa caattagctt 101760

gtggttataa tttaaattta gttaaatata agataaatga ttttttatta agtttagttt 101820

catttttcaa ggtacgatct caaagctact ctttaaccta ctatgaatga ataatgctga 101880

gttcataaca tctttgtaga tatatccaca attttccctc aggataagtg cctacaagtg 101940

gaattactgg actgaaaata atgcagtttg ctaagacttt gctatctgtt cctgaatgct 102000

cctccaaaaa ggttttgcca gtttacatcc tcatgaccag cgaatgagag tgttgcctat 102060

tttcctgtgc ccttgttact gcttaataat ttttgaaaaa aatctaattt gacagacaaa 102120

aatgcatttt atgttaattt gcttttctgg gatttttaat gaggttgagt atagttttta 102180

atatttttat tggccccttt ggaactagta tcataagttt tttttcttaa gaatttatgt 102240

agtctgggct gggcgcagtg gctcacgcct gcaatcccag cactttggga ggccgaggtg 102300

ggtggattgc cgaaggtcag gagtttgaga ccatcctgac caacatggtg aaaccgaatc 102360

tctactaaaa gtacaaaaac tagctcagcg tggtggcggg tgcctgtaat cccagctact 102420

taggaggctg agtcaagaga atcgcttgaa cccgggaggt ggaggttggt tgcattgagc 102480

cgagatcgcg ccattgctct ccagcctagg caacaagagt gaaaagtctc aaaaaaaaaa 102540

aaaaaaaaaa aaaaaagaat ttacatggtc tgaattgcca ttaaaagaga tatgagaatt 102600

attgagtaac aaataacttt ttaataattt aggcaagttt tggacgattg tactttgttt 102660

agaaaccaaa agcatagtat ttgtagtttt tttatttact ttagttgcta ggaagtaaac 102720

tttattcaag gtctctggta ccagttgttg ctaaaagtga ttgactaatc tgtcaatctg 102780

aaattatttg ttgctgaact gctaattctt ttgcttctat cttttaggca gatcttgtct 102840

ggactaccag actcaagaga ccaaatcaag cctttctaag acccttgaac aagtcttgca 102900

cgacactatt gtcctcccct acttcattca attcatggaa cttcggcgaa tggagcattt 102960

ggtgaaattt tggttagagg ctgaaagttt tcattcaaca acttggtcgc gaataagagc 103020

acacagtcta aacacagtga agcagagctc actggctgag cctgtctctc catctaaaaa 103080

-continued

gcatgaaact acagcgtctt ttttaactga ttctcttgat aagagattgg aggattctgg 103140

ctcagcacag ttgtttatga ctcattcaga aggaattgac ctgaataata gaactaacag 103200

cactcagaat cacttgctgc tttcccagga atgtgacagt gcccattctc tccgtcttga 103260

aatggccaga gcaggaactc accaagtttc catggaaacc caagaatctt cctctacact 103320

tacagtagcc agtagaaata gtcccgcttc tccactaaaa gaattgtcag gaaaactaat 103380

gaaaagtgag tatgtgattt tcttgtgtgt acatatgtgt ctcactttct ttttttaatt 103440

tactaagcag aacttcagat gaggaataaa atgattggaa tatttttttt ctcctctaac 103500

tacttgtaaa tttgggagaa tttggagagt gtagtagagt cagatcagtg tatggaaaag 103560

gagcaggagt gactggacct tctaagaagt gtgttatcag aattagtaaa tgaagggtca 103620

aatgtcctac ttttcccctc cactgatttt gacatcaaac cattatccac atagccttat 103680

ttcctccctc ggtcttaatt ttattaatat tttactgcac tttgcagata aaatttttaa 103740

aaaattttta aaaattgcca ataagtgaca tttattaagt tcagtgctta gtgtatattt 103800

ggattttatt tattagtcac aagacctttg tgcaggtagt aggcatgatt atcttttttt 103860

ttttgagatg gagtcttgct ctgtcgccca ggctggagtg caatggcgcg gtctcggctc 103920

actgcaacct ccgggttcat gccattctcc tgcctcagcc tcccaaatag ctgggactac 103980

aggcgcctgc caccacaccc ggctaatttt tttgtatttt tagtagagac ggggtttcac 104040

catgttcgcc aggatggtct cgatctcctg actttgtgat ccgcctgcct cggcctccca 104100

aagtgctggg attacaggca tgagccaccg cgcccggact gattatctta tttacacatg 104160

agaaaaccag ggcttagaaa ggttaggtaa cttcctctag gttgtacagt aaatgtggac 104220

ctagaagcat tttgacaaga gcacctgttt ttttttcttc tctattagtt tagaaattat 104280

atactcttaa ttatcacctg ggattttgat tagacagcct tcatgttctt tttcatctta 104340

aatgttcttt gtgtcttaaa gggctaagtg atttcttcag atcttttagt tcactcattc 104400

tcagtgaact aaaatgaggt ctaatctgct actgaatcaa gttttcagca tgttatttcc 104460

ttcctccctc cctccctcct tccttccctc aaccaggctc ccgaggagct gggattacag 104520

gcgcccgcca ccactcctgg ctaattttta tattttagta gagacggggt ttcaccatgt 104580

tggtcaggct gatcttgaac tcctgacctc aagtgaccca cctgcctcgg cctcccaaag 104640

tgctgggatt acaggcatga atcaccacac ctgacggcat gttattttca tcgcaaagtt 104700

actgtaagct gggagaagtg gcacacactt gtactcccag ctactcagga agcttaaggt 104760

gagaagattg cttgagccca ggagttttga gaccaacctg ggcaacacag caagacccca 104820

gctcaaacaa agaaaaaaag ttattgaatt ttttatttct atggatcatt ttttgtagtt 104880

tcttattcct ttcacccttc attcccactt ttgatcccat cttttattta tttagtttta 104940

ttaaatgtat atttgtctga taattctgct atctacagtt ttttgtggac ctgactcagc 105000

atttctttgt ttcttcggat tcagactgtt ggtggcttgt gattttagtg atttttggcc 105060

gtgaacatgt ttcttggact tttgtctgtg ggaattctct gtgtactctg tataaattaa 105120

gttacttcag gtgttttgca ttttcttttg ccatgcacct ggggcctggg tcactaccct 105180

tctggtacca cttaaaactg aatttttgtc ttgggtgctc gtactgatcc tgtatgagta 105240

caggtttata cttactgtag aaatatggtg tttgattatg gggtattgtc ccagatggtg 105300

ctggagtatt aatatgctct ctgttaaact taatgtgttg tccctgtaaa actccaaaat 105360

-continued

tctgaattcc agaatactac tggccccaaa tgtttaagat aagggcactg cctgtatttg 105420

tttctgcctc ccactatttt ccttagttta acacaaactc acctttttaa aaaacatttt 105480

gagagaattc agtattggga agagtttcta acctgtttct ggaaatggaa gtccaaagtc 105540

tgtttctgta attgtttttt ttttgagatg gagtctcact ctgtcaccca ggctggagtg 105600

caatgacgta ctctcagctc actgcaacct ccacctcccg ggttcaagcg attctcttgc 105660

ctcagccccc tgagtagctg ggattacagg tgcccaccac catgcctggc tgatttttgt 105720

atttttagaa gagatggggt ttcgccatgt tggccaggct ggtcttgaac tcctgacttt 105780

gtgatctgcc cacctcagcc tcccaaagtg ctaggattat gtttctgtaa ttgtaataca 105840

tttattgttt ttagaaactg tctttgcttt agtggtaatt ttcaataaaa atagaaatag 105900

cagtggagtt attaaaagag cattagttac atttttccct ttttcattat cttcaaatat 105960

tatatatagt aagtttgacc tttttaaaat gtatacttgt atcagtttta acacatacat 106020

agattcctgt aactgtcacc actataaggg taaagaacag ttagttcctt caccttttgaa 106080

gtcaagcccc acctctatcc caacacttgg caaccgctga tctttctccg tctcaatagc 106140

tttgcctttt ctcttttttt ttcttatttt tttttttgag acagcgtctt gctctgtcgc 106200

ccgagctgga gtgcagtgag gcaatctcgg ctcactgcaa cctccgcctc ctgggttcaa 106260

gcagttctcc tgccttagcc tccctagtag ctgggattat aggcacgcac caccacaccc 106320

ggctgatttt tttgtatttt tagtagaaat ggggtttcac catgttggcc aggctggtct 106380

caaactcttg acctcaagtg atccacctgc ctcggcctcc caaagtgctg ggattacagg 106440

cgtgagccac tgtgcccaat caggactttt ttttttaaa tttacattca acttgtcatt 106500

tttttcttgt atggattgtg ccttcagagt cacacctaag agcccttgc ctaagcaaag 106560

gtcatgaaga ttttctcata tgtttccttt taaaagtatt gtggttggcc aggtgccatg 106620

gcttatgcct gtaatctcag cactttgaga agctgaggtg ggcagattac gaggtcagga 106680

gatcgagacc atcctggcta atgcggtgaa accccatctc tactaaaaat acaaaaaaaa 106740

aaaaaaatta gccgggcgtg gtggcgggca cctgtagtcc cagctacttg agaggttgag 106800

gcaggagaat agtgtgaacc cgggaggtgg agcttgcagt gagccgagat cgcgccactg 106860

cactccagcc tgggcaacac agtgagactc catctcaaaa aaaaaaaaaa agtattatgg 106920

ttttacactt tacgtttaga tatatatctt ttttgagtta atgtcgtata agtatgaggg 106980

ttacgtcaga ttttttgttt tttgtttatt tttacatatg gatgtctagt tgttctaata 107040

ccatttgttg aaaagacaac ctttactcca ttgaattgcc tttgtacttt tgccatattt 107100

gtctaggcct gtttttggac tcctttttct gtttcatgat gtgtgtgtct attcctttgt 107160

taataccaca tggtcttaat tactgtatag taagtcttaa aattgggtaa tgctggcctt 107220

ataaaacgaa ttgggaagtt tttatttta ctcttatttc cattttctag aagagattgt 107280

gtagaattgg tgtcatttct tctttagata tttggttgaa ttgggaagtg atgccatctg 107340

ggcctagggt tttgtttttt gtgtgtgaga cagagtctca cttctgtcac ccaggttgga 107400

gtgcagtggt gagatcttgg cttactgcaa cctctgcctc ccaggttcaa gttatcctcc 107460

tgcctcagcc tcccaaatag ctgggattac aagcgtgtgc caccatgccc gactaatttt 107520

tgtatttta atgcagacag ggtttcacca tgttagccaa gctggtctcg aacttgtgac 107580

ctcaagtgat tagcccacct tggcctccca aagtgttagg attatagatg tgagccaccg 107640

-continued

tgcctggcag gggcctaggg ttttcttttt cagagtattt taaactatga attcagatta 107700

tttaatagat ataggactat ttaagttatc tgtttcttct tgagtgaatt tttactgtag 107760

tttatggcct ttgagtaatt aattgtattg aattgtcaaa tttatgagcg tgtaattatt 107820

tatagcattt cgggtttgta gtggtatccc tcttttattc ctggtgttgg caattgtgtc 107880

ttgtttttct ttgtcagatt gtatagggat ttattagtct tttcaaagaa ctagcttttg 107940

ttttgatttt tctgttgttt tgttttcaat tttattgatt ttctgctctt tattatttct 108000

tttctattat ttctgcttgc tttgggttta ttttactctt tttttttttct ccaagttgct 108060

taaagtagaa acttagattt ctggtttgag acctttcttt tctaagataa gcatttaata 108120

ctgtaaattt ccttctaacc actgctttag ttacaccccc acaaattctg gtattttgaa 108180

ctgagcacaa atgaaatgtt ctaatttccc ttgaatctta ttcttttacc aatgaattat 108240

ttagaaatat gttatttagt ttgcaagcaa ttggagactt ttttcctgtt atttttctac 108300

catttatttc tcatttcatt atattatggt cagagaatat attttgaatg atttcattta 108360

ttaattttta aaaataacat taaaaaattt tttaaaatgt gaatatacca catacagtat 108420

aaagattgta cattctgttt ttggacagtt ttctataaat gtcaagttga tttagttggt 108480

taatgatggt gttcagtttt tctttattct tgctgatact ttgtatgcag ttatatcact 108540

ttattactca gaagagtgtt gaactttcca actacaattt ttttttccaa ttttactttc 108600

agctctatct ggttttgctt catgtatttt gaggctctgt tgttaggtgt gtacacattc 108660

aggatgatat cttctgggtg aattgcctgt tttatcatta tgtaattccc tctttatggt 108720

aattttcctt gttctaagat cagaaatatc tgttgtccaa tttatataga cactgcagct 108780

ttcatttgat tagtgcttgc atggcatatc tttttccatt tttttacttt tgatctacct 108840

ttataattct atttaaaggg ggcttcttgt aggcagcata tagttgggta gtgttattta 108900

tttatttatt tatttattta tttatttatt tattgagaca gagttttgct cttgttgccc 108960

aagctggagt gcagtggtgc aatcctggct taccacaacc tccacctcct gggttgcagt 109020

gattctcctg cctcagcctc ccaagtagct gggattacag gcacgcgcac catgcctggc 109080

tgatttttttg tatttttagt agaaacggat tttcaccatg ttagccaggc tcgtcttgaa 109140

ctcctgacct caggtgatcc acctgctttg gcctcccaaa gtgctgggat tacaggcgtg 109200

agccactgca cccggctgag tcatgttatt tttaatcttt tctcacaata cagggttttt 109260

gttggtaaat ttaattattt taatataaat tttagtataa ttatttacat taaatgtaac 109320

tgttgcactg gggtatttat aatgtgtaaa tataattatt ggtattaata taattatatt 109380

actcataata atattaatat ctttggattt agattaccag tttagtatat gtttttctgt 109440

ttctccctct ttgatttccc ctttttttgct ttttttttttt ttttaattct tatttttttt 109500

tagtatttgt tgatcattct tgggtgtttc ttggagaggg ggatttggca gggtcatagg 109560

acaatagttg agggaaggtc agcagataaa catgtgaaca aggtctctgg ttttcctaga 109620

cagaggaccc tgcggcttc tgcagtgttt gtgtccctgg gtacttgaga ttagggagtg 109680

gtgatgactc ttaacgagca tgctgccttc aagcatctgt ttaacaaagc acatcttgca 109740

ccacccttaa tccatttaac cctgagtggt aatagcacat gtttcagaga gcaggggtt 109800

gggggtaagg ttatagatta acagcatccc aaggcagaag aatttttctt agtacagaac 109860

aaaatggagt ctcccatgtc tacttctttc tacacagaca cagtaacaat ctgatctctc 109920

-continued

tttcttttcc ccacatttcc ccctttteta ttcgacaaaa ctgccatcgt catcatggcc 109980

cgttctcaat gagctgttgg gtacacctcc cagacggggt ggcagctggg cagaggggct 110040

cctcacttcc cagatggggc agccgggcag aggcgccccc cacctcccag acggggcagt 110100

ggccgggcgg aggcgccccc cacctccctc ccggatgggg cggctggccg ggcgggggct 110160

gacccccccac ctcccctcccg gacggggcgg ctggccgggc ggggggctgac cccccacctc 110220

cctcccagat ggggcggctg gccgggcggg ggctgccccc cacctccctc ccggacgggg 110280

cggctgccgg gctgaggggc tcctcacttc gcagaccggg cggctgccgg gcggaggggc 110340

tcctcacttc tcagacgggg cggccgggca gagacgctcc tcacctccca gatggggtgg 110400

cggtcgggca gagacactcc tcagttccca gacggggtcg cggccgggca gaggcgctcc 110460

tcccatccca gacggggcgg cggggcagag gtggtcccca catctcagac gatgggctgc 110520

cgggcagaga cactcctcac ttcctagacg ggatggcagc cgggaagagg tgctcctcac 110580

ttcccagacg gggcggccgg tcagaggggc tcctcacatc ccagacgatg ggcggctagg 110640

cagagacgct cctcacttcc cggacggggt ggcggccggg cagaggctgc aatctcggca 110700

ctttgggagg ccaaggcagg cggctgggaa gtggaggttg tagggagctg agatcacgcc 110760

actgcactcc agcctgggca acattgagca ttgagtgagc gagactccgt ctgcaatcct 110820

ggcacctcgg gaggccgagg caggcagatc actcgcggtc aggagctgga gaccagcccg 110880

gccaacacag cgaaaccccg tctccaccaa aaaatgcaaa aaccagtcag gtgtggcggc 110940

gtgcgcctgc aatcccaggc actctgcagg ctgaggcagg agaatcaggc agggaggttg 111000

cagtgagccg agatggcggc agtacagtcc agcctcggct ttcacaactt tggtggcatc 111060

agagggagac cggggagagg gagagggaga cgagggagag cccctttttt gctttctttt 111120

ggattatttg aatttttcct taaatttatt tatcttactt atttatttat ttttttgagt 111180

gattctcctg ccacagctcc caagtagctg ggactgcagg catgtgccac tacacccagc 111240

taattttttt gtatttttag tagagacagg gtttcaccat attggccagg ctggtcttga 111300

actcttgacc tcaagtgatc cacctgcctc ggcctcccaa agtgctggga ttacaggcgt 111360

gagccaccat gccctgcctt tttctagaat ttatatattg agttcttgat tgtatctttt 111420

tatgtaggct ttttagtggc ttctctagga attacaatat acatactttt cacagtgtac 111480

tcacatttaa tattttgtaa cttcaagtgg aatgtagaaa acttaaccac ataaaaata 111540

gaactaggga tgaggttaaa aaagagagag aaaagaaatg taataaagat ttaataacac 111600

cgttttttt ttttttctc ttttttttt gagacagagt ctctctttct gttaccaggc 111660

tggagtgcag tggcgtgatc ttggctcact gcaacctccg cctcctgggt tcaagtgttt 111720

ctcctgcctc agcctactga gtagctggga ttacaggtgc gcgccaccat gcccagctaa 111780

ttttgtatt tttagtagag acggtttcac tgtgttggcc aggatggtct cgatttcttg 111840

accttgtgat tcgctctcct cagcctccca aagtgctggg attacaggcg tgagccaccg 111900

cgcccggcta agtctttaaa tatttttttg acattgcact ttttctcttt tccttctagg 111960

attttagtaa cccaaatgtt agttttgtta ttgtttggca ggttcctgag gctttcctta 112020

cttctttaaa ttttttttc ctgttgttca gcttcgaaaa tttctattca tctgtcttca 112080

aattcactgg ttctttcccg ttatttccat tctgttattg agtctttgta gtgaatttta 112140

aattttgttt attatgtttt ttagttctaa aattttcttt ttttgtgtat gtcttatact 112200

-continued

ttgctcctga aactcttatt tgtttcagga gtgatcttat ttcttagagc atggttttag 112260

tagctactta aaatttgttt tatcatccca gcatatgtgt cctcttgatt gtcttttctc 112320

ttgtgagata atgggatttt ctggttcttt atatgacaat taattttgga ttgtatcttg 112380

gacagtttga cttacgttac atgattctga atcttgttta aatcctgtgg aaaatattga 112440

agtttttgct ttaacaagca gttgacctag ttaggttcag tccacaaatt ctaagcagca 112500

ttctgtcggc tctggttcca tcatcagttc agttttgtat cttatctgct tatgtgcctt 112560

tctgtgtcca gtctgggacc tggccaatgg tcaggtccca aagcctttgt acacttttag 112620

aagcagggcc atgcacaccc agctcacgag tggccccggg agtgcacata caactcgacg 112680

ttttcatggg ctccttcttt tctgtgatgt ccctgacacg ttctgccttc taagaacctc 112740

cctttatccc tttcctgttg tctggctaga aagtcagggc tttagattcc ctatacttca 112800

gcacacttcc tgtagctatg tcaacctctg tggccacgac ttcttcttct tgggactgca 112860

gtttctcttg tcagaaagta ggattcttgg agctgctgtc attgctgctg tggctgctct 112920

gatgctgcct gggagtcgaa ggagagaaag gaacaaaaca aaacaaccca ggggatttcc 112980

tccactctct ttgatccgtg agagcccccc ttcctgttcc tcagaccaga aatagagggc 113040

ctgtcttgga acttcttctt tgtgcatctg gtgtgcagtt tcagcttttg agtccaggcc 113100

aggaggtgct ggacaaactt gtcaggagta cggaggtact gcaagttctg attacttttc 113160

tcagtccacc tgcttccaag tccttggatg catttgtcca ttgttttgag ttgcattcca 113220

tgggagagac agaagagtgt gcttatttca tcttgacata cttattagga tttcatatca 113280

aatcaacgga tgatattctc tatattaatt tgctgttttc cctttagcaa gcacattagg 113340

aaaataacac tttaacaccc gcctttggtg gtttctgtca taattattaa tacttgactt 113400

ttttttttct tttgagacgg agtctcactc tgtcctttga ggcattgtcc ccataaactt 113460

ttggtaaagc atcaatаatt ttatctttca tccacacaag cttcaccata aatttgatgt 113520

ttattcttcc attttagcag aattcatgtt gctccaatag gggctgtctt caaactgatg 113580

ttttctcctt cttagtgcct cagagtagat cctgttcaga tacgttataa caggttaata 113640

tgagtttatt ttggtgtaaa agtactttga aattcatgca tagtttttтc atcatatgca 113700

ttttccatag ctttgaacac ccccatgtaa ctctcctctt ccacaaacca aacaatgaaa 113760

aagcaccttt gtgatggaag tttattttgc aataggaact cacagtgatc taagccctgc 113820

tattcatgaa tataattcat tactggagtc caagttgctt tttggttttt gaagttctct 113880

tcttcccttg caggtataga acaagatgca gtgaatactt ttaccaaata tatatctcca 113940

gatgctgcta aaccaatacc aattacagaa gcaatgagaa atgacatcat aggtaagcag 114000

tgcttgaaac tatggcaaaa aaaaaatgac aaaaaatgca cagaactgac aattttcgtt 114060

attgactaag ataatttttt cttaacatgg aatttagcag ttcccttcct aatttgtttt 114120

ctgagtattt tttatatcgg attatagctc actttaaaag tttctcggct gcattcggtg 114180

cgagggtctt tgcctgggcc agatgggctg cagtgtagcg ggtgctcagg cctgcccgct 114240

gctgagcagc cgggccggcg ggcggctacg ctaaccggca cagaccaccg gatggactgg 114300

ccggcagccc cgcaccagtg cacgaagtgg gcgggacaga aacttctggg gttggaagtc 114360

cagtgaggct aaaagccggt accaaagtct ctaggcatca gggctgcagc ccaagagtct 114420

cacgaccagt gggcaactgg atggccagac aggtgtctca gtggtggcct ctccgtctca 114480

-continued

gggcttcatc ccacttctca gtgggcctga cgtccctggg caccctggat gtctacctgc 114540

attagccaga gccatcacat ggcctgtgac ttgccttttt ttgccagttg attgtgccac 114600

acacagtgtc atttctgtgt catttggcac agctggaggt gcaaggagga gggcagcctc 114660

atgtccagtc ccagtttcac gtaactttat tcttctgaat aaagacaatt tgctaacctt 114720

aaaaaaaaaa aaaaaaaaaa agtttttctt atatgttgga cccaaattct taggctttaa 114780

cctgaataac aatgacagca agatcaataa atagtacaca tttattaaac actcactgtg 114840

tcccagacaa tattccaagc acttttatg gatagactca ttttaacttc taaagaactt 114900

tgtgggataa atacagttat tttatagatg aagaaactga agcacagaga agttaagtgc 114960

tttgtccagg gtaacagctc agatatggca gagtcaggat ttgaaactag accctcacat 115020

accttaactg ctgtgctgtg gcagtgtttt tcatactgta ggttgggacc agccttctct 115080

tatgccctca ccccctgcca aaaaaaaaaa aaaaaaaaaa aaatatatat atatatatat 115140

atatatatat atatatatat aatatatata tatataaaat atatatatat ataaaatata 115200

tgtattagta tatatgcata tatagtatat attatatatt agtatatata ctaatatata 115260

atatacatat tagtgtgtgt atatatatat atactagaat aaaaaaatca aagtatctca 115320

gagtagtaag gacaaacatt tcagaaaaat gttttcatta tatatacatg tatgtatgtg 115380

tatgctgatt caacaaatat atttcttata ggttatagca aaatagtttg aaagctttta 115440

ctgtgtttta tcaggaagac cttaggtgaa cgtatattca cagataaaag aggttattta 115500

ttcattcaat aaatattaca ttctcataag tcctaatatt atgtattttt attcttcaaa 115560

aaagttagta tttgtgattt atgaaataag acatgttctt gcacttttag cagatctgtc 115620

ccgatgttgg gcttctttaa tccttagtgt gggtgctttg cactcactca ctgctgggga 115680

cagcaagacc cctgttagtc tcagctgtgt ttcttaaatt ggcccactgt accttccagt 115740

tagctattct ggggtccatg tcatgttggc tccattttcc ttttctttct cccacacaga 115800

tacctataac ggctataaca taggcctggt ggctgttggt ggcttatccc tatctgcttg 115860

tatttaaggg gtactgtttc actgagtttt gctgacagat gttgtcatga gatttgaggt 115920

tttctgtgtt gttgctctat ttttatgtgg gaatttgcta ctatcatcat ccctagacca 115980

gcttttccta gtaatacaac agggatgttc tgactgatta gagtttgcct gtttgaagaa 116040

ttggttggct agtgattttt ttttgagggg agtctgtacc agttaatagc ctgactggcg 116100

tgtggataaa aaggaagcag tttcaagtca aataaaacac ttaaaatgaa accacactgc 116160

aactctcttt cttttactta agcttaatca aattaatgat gatgtaatcc catgaaggaa 116220

aagtcttctg aaggatcaag ttgataacat tttgtgatca aagaatttga gaaaacctct 116280

atcccagtgt ctatcattat atattttagg atgttaatta cctgtgtggc tttaggcaag 116340

tcatttttcc tccttgagcc ccattcttaa tcctgtccaa attatttgtc tcctcttgca 116400

gttggactat tttaatatag ctgtccttca agtgagtttt gttcaaagga gccttcactt 116460

tagctcttac tgtgtaccca ctttgcatag tcttgtttta aatgtaatcc ttggattttt 116520

ggtgttgcta actaattact gtttttatgt gaggatttag agtgatccag aatctatact 116580

tgcactacct ccttcatctt ccacaaatgt ttgaagtggt agaatttttа aaaactttga 116640

aggtacagct gacagaattt gctgatggtt tggaagtgag tggtatgaga gggaaaaaaa 116700

ggaataaagc atgactgcat tttttgtttg tttgtttgtt tgtttttgag acggagtctc 116760

-continued

actctcgcca ggctggagtg cagtggcgtg atcttggctc acggcaacct ccgcctcctg 116820

ggttcaagcg attcccctgc ctcagcctcc caagtagctg ggactacagg cgctcgccac 116880

cacgcctggc taatttttt ttttgtattt tagtagaaac ggggtttcac cgtgttggcc 116940

aggatggtct ccatctcctg acctcatgat ctactcacct tggcctccca aagtgctgag 117000

gttacaggca tatatataag catataaagt gtgttatagc atacaaacag gtatatatat 117060

aaacatgcag tccacacagc tgataggaat gaggcagtag tgaaggagaa gttgatgtag 117120

gagaggggac agttgttaca ggaaagaagt ctggaggcag aagggatgaa ttccagtgct 117180

cacatagaag attgcttaga tgggagcaag gacaatttat ctagagtcac aggaaagaat 117240

gcagtacacg ggtagagatg caggtgagtt gaaagatgtg agagatgatg gaaataattt 117300

tctgattgct tctatattct caaggaagca ggaagcaaag tcctcagcaa agagaataga 117360

agaggtgtta aatatttgag aaaggagatg tactgtagaa aaaaaaaaaa ctcagtttct 117420

ccttctgaac tctcacaaaa cagaaccctt ccatgactct agttgtgtgg ggtttttcc 117480

ctgtcagcta ccaattctgc agatgattgt tcagtgaaca ccaactgggt gtcctctaag 117540

tcagttcagt tctcacactg tttacctgga gatagcatca gatcccacag attgaggact 117600

ctgtcccaca agactgcctc cacttcagat gccagtctca agtacaagtt gtggcctgtg 117660

cttctgactg accttctata aattggagtt cccacagtcc cctccttggg ttcaataaat 117720

ttgctagagc agctctcaga actcagggaa atgctttaca tatatttacc catttattat 117780

aaaggatatt acaaaggata cagattgaac aggcagatgg aagagatgca tgggcaaggt 117840

atgggagagg ggcacagagc ttccatgcac tctccaggtc atgccaccct ccaagaacct 117900

ctacagattt agctattcag aagccccccc ccccattctg tccttttggg ttttttgtgg 117960

agacttcatt atataggcat gattgatcat tggctattgg tgatcagctc aaccttcagc 118020

cccctcatcc cgggaggttg gtgggtaggg ctgaaagtcc caaacgtgta attctgcctt 118080

ggtctttctg gtgattagcc ctcatcctaa agctctttag aggccacagc cacaagtcat 118140

ctcattagcc ttcaaaagaa tccagagatt ccatgaattt taggcgctgt atgctaagaa 118200

actggctaaa ggccagttgc aatgtctcag gcctgtaatc ccagcacttt gggaggctga 118260

ggcaggagga tcgtttcagg ccatgagatc aaaaccagcc tggtcaacat agtgagaccc 118320

ccttacaaaa aatttaaaaa ttggccaggc gtaatagctc ttgtctgtag tctcagctac 118380

tcagaaggct gaggatcact gagccctgga gttgaaggca gcagtgagcc atgatcgtgc 118440

cactgactcc ggcttgggtg acaaagtgag accttgtctc agaagaaaaa ggaaaaaaaa 118500

aaaactgggc aaagactaaa taacatattt cacagtatca cagatttgta ttgtctagga 118560

aagtgaatgt aaacagacca ggacactagt atgatccctt ggtttcatga aggtcccact 118620

aaagtcatga acacaaagtg agactaggca tcatgttata tggtttttcc agccatgttt 118680

aacagctagc taaatagcta attgtttcgc tgcagtttat tttagcagtt ccttatttta 118740

gcacatttca tgttttaaaa tttctaccaa taacatttta ataaactttt ttacagataa 118800

cttcacaaat ccataatttt ttaagttaca atcccagaaa tagaattgct cattgaaagg 118860

gtatgttcat ttttaaagtt atgctagaaa ctgccaaatt gccttcagaa aaaggtgttt 118920

gtatccccac taacactagt gttagttttc ttgtgccctt gctcaagtat acatattatt 118980

aaaaacaatg ttgggccagt ttactagata aaaggtgtag tgcctcctta ttctaatcta 119040

-continued

tttgattact agtgagtatg tatgtctttt cacgttggtc attttatgtt tgttcctttg 119100

tggattgtca tgtcctttgc tcatttttct tttggaacat ttcttagtag tttataagag 119160

ctcttggtat tttaatgata gtaacctttt aactgtcatg catgctgcaa atctttttte 119220

tgtttgtttg cctttgtatt ttgtttttgg agggtttcta tgtataggaa ttaaatttta 119280

tgttgttaaa tcttttgatt tctgcttttg catatgtact tcaaaagact ttctatttta 119340

agatcaagtg ttacctgtat tttcttttag ttctatttaa aacctcttaa tttatatgcc 119400

tgtgctgtta actcccaagt tgattcacaa gtgtgtatac atagtttgaa tttagtggca 119460

atttaattat ttacaacttc ttttgcagca aggatttgtg gagaagatgg acaggtggat 119520

cccaactgtt tcgttttggc acagtccata gtctttagtg caatggagca agagtaagtt 119580

agttcatatt ttcacattgt gcatcctagg gaatttgggt tcattgttag gaatgggctt 119640

cactcagcta aaaacaaagt atttttgaga atttaaatat tttggatatt tacaagatca 119700

tataaagcat actctatctt ggttaacagt ttcttttaaa tataaattat gtgaactctt 119760

aaaattttca ttttcatttt caatgttaat atttcctaag ttaaaataat ttgtttttag 119820

ttctgaaata atttggggag tgattgagtc tgtagtgatt atgactatta gaattggttt 119880

atttatttaa ataatgcatg tcttcagatg gctctcctaa tttgttagtt aggctttaag 119940

ctaaatggat gctatataac taaatccaca tagatttgtt gaaatggctc cagaggtttt 120000

ttagatttat tactgctatg tgcccttaaa aaaaatctat tcattctttc acttaacatt 120060

tatcagaaga gtgctctgtg taagacgtgg ttaggcatag tgccagtctt gaaggaagtt 120120

acagcctaat aaaagacata gggcatgttg tttggttact gtaatatgaa gtggcatgtg 120180

ttaaatgtca ggggagaact acaaagtcat aaaaaggtgg gagagattac atacaggtaa 120240

aggaatcagg aatgacacca tggggagtaa ggtagtgttg acctaggcct ttaagataca 120300

atagggacag tatggaaaga gtatattttt cccacttaaa ctctttcctt ggtcgttccc 120360

tcaaattttc cattttgtcc atgtgcaggc actttagtga gtttctgcga agtcaccatt 120420

tctgtaaata ccagattgaa gtgctgacca gtggaactgt ttacctggct gacattctct 120480

tctgtgagtc agccctcttt tatttctctg aggtaaagtc tgcatttctt ttcacactct 120540

attcgagcat tccagcctct aactatcaat gctggggccc tgtctatagg aaataacaca 120600

gaagagccaa gtcatttcca aaaagatgta tcattgtttc aagttgtttc tgatggcaag 120660

agtaatttaa taatatatta gagagaacat gaaaattcaa tgtattaaat aactctaatt 120720

ttgagaaacc taattaaact actgcatgta agagagtgca tgtttttaat tatttggagc 120780

tattttaaaa ccacagaatt tgaaacttgc ttccagtgca taaattgcag accagacttc 120840

agaagagaaa aaaagtagta aatttttttct tatgctcatc atttttacttt tagtcacttg 120900

ataggattgc ccagtgaaga agcatttgca acagacaatg agtatattaa tctttttgag 120960

gcatacagtt tagtataatg ctctttgtta ggcttcaaca agtgaaatta ttttgttgga 121020

aagcaaatga ctattaagta gaaagaggat tcccagtctc acaaagcagt aatttagaca 121080

ctcgattctg cctctttaca agaatacagg tactcagttg atttgttttc tcactccctt 121140

tctttgctat aagtttaaat caacaatttg tttaggttaa tatgtcctca tggaatggtg 121200

gaaatgatca gatataaaat atttggtttg gttagtttac tctttatatg tttgctggca 121260

aggaaccaca aatccagttt agtataattt ttactctagt tcactaaaag tttgcatcca 121320

-continued

gctgtgtagg tagtgtttgt ttcttgttaa ctttttttc gtctaaaaga atactttaaa 121380

actttcaat ctcaaatgac tgtaacttgc tgacaggtgt taacagaaga agtagatctt 121440

tttgtttttt gcttatgacc tgtattttaa tatttgagct tatagattag agattgtgag 121500

agaaatctgt ttatagtctt attttccctt gtgtattttt tcttcctagt acatggaaaa 121560

agaggatgca gtgaatatct tacaattctg gttggcagca gataacttcc agtctcagct 121620

tgctgccaaa aagggccaat atgatggaca ggaggcacag aatgatgcca tgattttata 121680

tgacaagtga gttatattga tagatggatt cagcagatac ttattgaaca tttgatatgt 121740

tttgtggaaa taaagatgaa taaactcagt ctctgttgtc aaggagctca caggaggcag 121800

cataaaagct gcttttatat ggtgtttgta aagctttggg ggttcttaga acaaaagttt 121860

ctgctgggaa aggggaggtg tatgtggggt aaacaggatg gcaatggtgg tgttcaagga 121920

gtgtttccca gaagagagat tttgtttgga tcccaaagaa agaagggaat tttgctaccc 121980

agagaaggca gaaaacaaca ttctaggcaa aggcattggc ccagaagcca tggaaacgta 122040

ggggaaagtg gcactttcaa gaaacttgag tttagataat caaaggagtg gggaataaat 122100

atgaggatgc tggtactaat tggaatagat tgtaagggac cttgaatgcc tatttatggg 122160

tatattatac tttctgtata aatctgctca ggcacgttgt taattagttt tttattagtt 122220

ttcactgaaa atgagaggat ggaaacatca tacagtaaac aaaattgaaa atatctggtc 122280

aggcagatga tgagcttgtg gccagctctg taacgtatgg tattcttttc atttaacttt 122340

tcttactctg taaaaaaagt aattcgtggt cgggcacggt ggctcactcc tgtaatcaca 122400

acactttgag aggcagaggc aggtgaatcg cttgagccca ggaatttgag accagcctgg 122460

gcaacatggc aaaacccgcc tttactaaaa atacaaaaat tagctgagcg tgatggcgtg 122520

cgcctgttgt cctagctact taggggcctg aggcagaagg atcacctgag ccttgggagg 122580

tcgaggctgc agtgagctgt gatccactgt actccaccct gggcagggca gtagagtgag 122640

accctgtctc caaaaaaaaa aaaaacaaca aaggtaattt gttatttgta tccttaagca 122700

aatgctaaag gggtaacttg gggatagaga aaagtccaca gatgttaggg tttgaagaca 122760

ctaatagtat ctaggccagt ggttcctgaa cattagtctg tgggctcttg ctgggctgtc 122820

tgcataggaa tcacctgaga gcttattaaa aataggtttt caggctggtt gcggtggctc 122880

acgcctataa tcccagcact ttgggaggct gaggcaggcg gattacttga ggtcaggcgt 122940

tcaagaccag cctggccaac atggtaaaac cccgtctcta ctaaaaatac aagaattagc 123000

caggcatgat ggcacacacc tgtaatccca gctactcagg aggctgagga aggagaattg 123060

ctcgagcccg ggaggtggag gttgcagtga gcggagatca tgccactgca ctccaggctg 123120

gctgacagag ggagactctg tctcagaaaa aaaaaaaaaa ataggttttc agtctgggta 123180

ccggtggctc acacctgtaa tcccagcact ttgggaggcc aaggcaggca gatcacttga 123240

ggtcaggagt ttgagaactg cctggccaac atagtgaaac cttgtctcta ctagaaacta 123300

caaaaaatta actgggcatt ttgacgggtg cctataatcc cagctactag ggaggctgag 123360

gcaggagaat tgcttgaacc cgggaggcag aggactgcat ctcaaaaaaa aaaaaaaaaa 123420

aaaggtttcc agtccccctg tctcagaaat tctgattctg caggtttgag gtgtgaccag 123480

gaatctttat ttttagaaga cataccagat aattctgata aatagccagt ttagggatgt 123540

agtctaattt tcctattttg caagtaagga aaataaggcc cagagaggta atgattttct 123600

-continued

caaagtcaca gaacaagtta gtggcagaat ttggactgga atgcagttct taatgttctg 123660

tccagtgttt attctggtac agtatgtttg tagaaggtat tacgtaagaa acattgttat 123720

atagatgttg agataggaag agtttacatt tagaaatttg gtctaaaatg cctgaacatt 123780

caagtcgtgg aggagtattg accaacttac tcaatacaac ataggagatt cacattttgt 123840

tacaaaaatg ctgatttaaa aggagagttt tctttttttt cttctttttt atttttgag 123900

atggagtctt gctctgtcac ccaggctaga gtgcagtgac acgatctcag ctcactgcaa 123960

cctccacctc ctgggttcaa gcggttctcc tgcctcagcc tcctgagtag ctgggattac 124020

aggtgggggc caccacgccc agctaatttt tgtattttta gtagagacag ggtttcacca 124080

tgttggccag gccggtcttg aactcctgac ctcaagtgat ccacccacca ctgcctccca 124140

aagtgctggg attataggcg tgagccactg tgcccagcct gcttgttttt gtatcatata 124200

tatgcatcat cataatcatg cattatcaac ctttgtattt ctgtcaggac atagaaacca 124260

ttagagtgct tggaagagag cctttttttt tttctcgcat ttaatgcttt ttttggtatt 124320

catttcataa tcagcttacc aaaacattac ctgcattata ccccatcaag gtagaaatct 124380

ttgtgttatc aatattggtt actccctttc cacaccgagt catcagtaag tcctgttcta 124440

tccaaatagg tcatatgcat ctagctcacc cctcagtgct gttttgtttt gaatttgtac 124500

atgtttactc ctgatgcctt gtagttatga tgatgtgttc ttattttatt ctgtgcatac 124560

aagttctcag ctcgcttttt agggaaaatg accatgtctt cctttcctat aaattccttt 124620

ctatctatca agtcctcaac agagaatagg tacccataaa tatgtgattg ttagtttctt 124680

tgcctcagtt gtagtctgat ccttacagct tttaaacaac agtagagttc accgtcaaga 124740

actaaggatg gttggcaggc agatagaaag gtagcaagtt gacccaacta tctctgggga 124800

agtgggaaca aagaaaggtt acatcagcac tgtcatcaca tagctctata gttctaggcc 124860

tgcaggctca atcaagtagc cttgtataag attctctgga ggaggtgctg aaagttgctt 124920

atacttgcta tggaatttga ttttacttcg gatatctttt taccataggt acttctccct 124980

ccaagccaca catcctcttg gatttgatga tgttgtacga ttagaaattg aatccaatat 125040

ctgcagggaa ggtgggccac tccccaactg tttcacaact ccattacgtc aggcctggac 125100

aaccatggag aaggtaaccc agaacttcaa acgtatcaaa ctacaagaag ttttattggt 125160

agaactcata aaatataagg tgggaaaacc aagcagaata gcacagtgga aattgaagca 125220

gtccagcaaa gtgattaaga gcagaggcct tgagtctggc ctggtatgta cagtcacgtg 125280

ccacataaca ttttagtcaa cagtggactg cgtgtacgat ggtcctgtac gattataatg 125340

gatcaaagct ggtagtgcaa taataacaaa agttagaaaa aataaatttt aataagtaaa 125400

aaagaaaaaa gaaaaactaa aaagataaaa gaataaccaa gaacaaaaca aaaaaaatta 125460

taatggagct gaaaaatctc tgttgcctca tatttactgt actatacttt taatcattat 125520

tttagagtgc tccttctact tactaagaaa acagttaact gtaaaacagc ttcagacagg 125580

tccttcagga ggtttccaga aggaggcatt gttatcaaag gagatgacgg ctccatgcgt 125640

gttactgccc ctgaagacct tccagtggga caagatgtgg aggtgaaaga aagtgttatt 125700

gatgatcctg accctgtgta ggcttaggct aatgtgggtg tttgtcttag tttttaacaa 125760

acaaatttaa aaagaaaaaa aaaattaaaa atagaaaaaa gcttataaaa taaggatata 125820

atgaaaatat ttttgtacag ctgtatatgt ttgtgtttta agctgttatg acaacagagt 125880

-continued

caaaaagcta aaaaaagtaa aacagttaaa aagttacagt aagctaattt attattaaag 125940

aaaaaaattt taaataaatt tagtgtagcc taagtgtaca gtgtaagtct acagtagtgt 126000

acaataatgt gctaggcctt cacattcact taccactcac tcgctgactc acccagagca 126060

acttccagtc ttgcaagctc cattcatggt aagtgcccta tacagatgta ccatttttta 126120

tcttttatac tgtattttta ctgtgccttt tctgtatttg tgtttaaata cacaaattct 126180

taccattgca atagtggcct acgatattca ttatagtaac atgtgataca ggtttgtagc 126240

ccaaaagcaa taggttgtac catatagcca aggggtgtag taggccatac catctaggtt 126300

tgtataagta cactctgtga tgttagcaca atggcaagca gcctaacgga aattctgttt 126360

attgattgat tgattgattg attgattgag acagagtttc actccattgt ccaggctgga 126420

gtgcagttgc acagtcttgg cacactgcaa cttctgcctc ccaggttcaa ccaattatcc 126480

tgcctcatcc tcccaagtag ctgggattac aggcaggcac caccatacct ggctaatttt 126540

tgtattttag tagagacagg gtttcaccat tttggccagg ctgttctcga actcctgacc 126600

ttaagtgatc tgcctgcttt ggcctccgaa agtgctggga ttacaggcat gagctaccat 126660

gcctgggcag taactgaaat tctctaatgc cattttcctt atctgtaaag tgacgataat 126720

atgcacgttt acctcaaagt tactttgatg attaaagtaa ggtaatgtat ataaaatacа 126780

tattaacata gtacctgaca catggtaagc atcaaaaaat gttaactact tttattacta 126840

ttattattac gtatttttaa ataattagag agcagtatca aaaattagct gggcgtagtg 126900

gcatgcacct atagttccag ctactcagga ggctgaagct ggaggattgc atgagcctgg 126960

gaattaaagg ctgcagtgag ccgtgttcat gcccctgcac tccagccttg gtgacagagc 127020

aagaccctgt cttgaacaat taaagaaggc attatgccgc aacgttagct tagaaatgat 127080

ccacatatat caccagtaac tgtcaacagg attggaaccc tagttttggg tattatgatc 127140

acaaggtatt attaatagct tattaataat aaagcgttgg ctaggcacgg cgactcacat 127200

ctgtaatccc agcactttgg gaggccgagg tgggtggatc acctgaggtc aggagtttga 127260

gaccagcctg accaacatgg agaaacccca tctctactaa aaatacaaaa ttagccgggc 127320

gtggtggtgc atgcctgtaa tcccagctac ttaggaggct gaggcaggaa aatctcttga 127380

acccgggagg cagaggttgc agtgagctga gatcgcacca ttgcactcca gcctgggcaa 127440

caagagcaaa actccgtctc aaaaatataa ttataataaa taaataaaag taaagtattg 127500

atgtttgtga atgatttatt cttctaatga actagaggag atttttccag gaatttcaga 127560

gccagtgagg ttatgttgct tgtatgtgtc atgtgtatcc aggtgaaaaa acttaattaa 127620

acgctattat ataataccat acataaaaac tgaattttag gaatactgaa gaatgacata 127680

tagaagtcaa atcattaaat agctagtagt aaacagaata gagtgtcagc tgttacccaa 127740

tgatgataat attttcacga ttaaaattaa acctttttctg attttaaagg aaaagttcag 127800

atctgtatca tataaagaat gtaaattttc agggtaataa aattaaaatg cagagagaaa 127860

aatgcaaaaa tagttcttac tagatgtgtg tatgtaagga acttagacta attttaagaa 127920

cactgtcaag accctggtag ttaggtagga aaaaagacat gaatgattca ttcaacaaaa 127980

actttgagta tttctgtgct agatggtagt gttacagtgg taaacaaaat aaatgtgttt 128040

ctgctatcct ggagcttagt ctacaaaaaa ggtacatatt ggccgggcac ggtggctcac 128100

gcctgtaatc ctagcacttt ggaagatcga ggcgggtgga tcacctgagg tcaggagttc 128160

-continued

aagaccagct tggccaacat ggcgaaaccc cgtctctact aaaaatacaa aaattaactg 128220

ggtgtggtgg cggacacctg taatcccagc tactcgggag gctgaggcag gagaatcact 128280

tgaacctggg agacagaggt tccagtgagt cgagatcatg ccactgcatt ccagcccggg 128340

ggacaaaagc gaaaatacgt ctcaaaaaaa caaaaacaaa caacaaaggc acgtattaaa 128400

tacgaacata aatatttaca aattatactg aataagttct catgtttatt atttgcttgt 128460

ccagttacaa acttttcctt cgtagaatta gaaatataaa taataaacat gagaactcat 128520

tcagtataat taataattat taaatgtaaa taaaaacatc tatgtacaat taggcattta 128580

tttaagaatt atttgaaaaa aaaacaatgt ggaaacagat attttgatat attgctagtg 128640

attgaaattg ataatgttct tttgaagagt aaagtgacca tatatattaa agttaaaatt 128700

taactcagca atcacacgcc tggtgagtta tcttaaggaa atcagtttga aagtaaaatc 128760

aatatatgca caaagacttt aacatttatc ataaaccaga aaaatcgagt ttcaaattat 128820

atcctatgga ctattttctg ctaaaaagta ttaatatcaa ctttatgtaa tactttcgtg 128880

acaaatattt tgggggagaa aacccaacaa aattacatgc attgtaattt ttttttttt 128940

ttttttttta gacagtcttg ctccagcgtc caggctggag tgcagtggtg caatctcggc 129000

tcactgcaac ctccatctcc caggttcaag caattctcct gcctcaggcc tcccgagtag 129060

ctgggattac aggcgctcac caccatgcct agctaatttt tatagttttt agtagagatg 129120

gggtttcatc atgttggcca ggctggtctt gaactcctgg tctcaagtga tccgtctgcc 129180

tcggcctcct agagtgctga gattacaggt gtaagccact gcacccagcc ttatgcatta 129240

taattttaat ttgtaaactg tacaaaggga taatacttgt agtacaacaa gaagtaaaaa 129300

catttgttat aggtagttaa catttgtaac cagtagaatt ataggtaaaa tttatttatt 129360

taaaacagtt ttagttggat ttgatttcaa ctttaaaata atgcttttca tctctatcag 129420

gtctttttgc ctggcttttt gtccagcaat ctttattata aatatttgaa tgatctcatc 129480

cattcggttc gaggagatga atttctgggc gggaacgtgt cgctgactgc tcctggctct 129540

gttggccctc ctgatgagtc tcacccaggg agttctgaca gctctgcgtc tcaggtattg 129600

actgattgcg tctgccatta gggagaaaag catacacatc ctttccttca catcccagta 129660

acagatccta ttatttgtaa attttaagtt gtggaaaaaa aagataaaag ccaggcacag 129720

tggcctgtgc ctgtaatccc agcactttgg gaggctgcgg tgggcggatc acacgaggtc 129780

aggaattcga gaccagcctg gccgacatgg tgaaacccca tctctactaa aaatacaaaa 129840

attagccggg catggtggca ggcacctgta atcctagcta cttgggaggc tgaggcagga 129900

gaatcgcttg aacccaggag gcagaggttg caatgaacca aaatcacgcc actgcactcc 129960

agcctgggtg acaaagtgag actgtgtctc aaaaaaaaaa aaaaaagaga gaaataaaat 130020

tagcctactt actatcttct aatcaaagca tttgtggtaa cttaaaatat actgtattgt 130080

aaagtatcat gctgtttcat ttaggccatt attctatttg aatctgtggc tgtttctctt 130140

aataaatcaa gtaatatgga atatattcat agcctctgaa gagctcttta tgtaagtatt 130200

tatttaggat actttttgta aaataagtga atgaattctt aggtctcctt ttttttttctt 130260

ttcttgagac agggtctcct cgctgcaacc tggaaattct gggctcaaat aatccaccca 130320

ccacagcctc ctgaatagct gggactagag gcatgcacca ccacgcctgg ctaatttgaa 130380

atttttttttt ggccaggcat gatggttcac gcctgtaatc ccagcacttt gggagaccga 130440

-continued

ggcaggcaga tcacgaggtc gggagatgga gaccagcctg gccaacgtgg tgaaaccccg 130500

tctctactaa aaatacaaaa attagctggt tatggtggct catgcctgta atcccagcta 130560

cttgggaggc tgaggcagga gaatggcttc aaccagggag tcggaggttg cagtgagccg 130620

agatcacgcc actgcactcc tgcatggtga cagagtgaga ctccatctca aaaaaaattt 130680

ttttttaaa tgatggagtc ttgctgtgtt gctcaggctg gtcttgaacc cctgacctca 130740

aatgccgcct gcttcagcct aagtttcttt ttttttgta aagagacagg gtcttgctat 130800

gttggccagg gtagtctcaa actcctggct tcaagcagtc ctcccacctt ggcctctcaa 130860

agtgctggga ttacaggcgt gaaccactac ctataatgtt gtgtttcact caaggccttt 130920

tgatttcgtt ttgcattacc gtgccacatt gtgcatttcc ttgacctttt ttgggttttt 130980

tggagtgctt tcatatgtta aaccatacct gattctcctc aaaatcacac aaagtagaat 131040

atcctaagac aagaaatcta aggaggcata aagaagttaa ctggttttat taaactcaca 131100

cagtaaatga tagagccaga aatattcccc ttctagtgtt cttcaccatc agcttaatgt 131160

agcataataa ttttctaatt actgttgaca aataaataac cctttgaatt ttcaatactg 131220

ggccttggat aaattttcct aatttgtaag agagtattat cgtattgcca tttacaaagc 131280

tctcctgagt atctttttct tctgttaagt ttacctagga gataaactgc tgagtatggt 131340

tgccattttg gttttttgat ataggttaga atgtcttggt ttttttttt ttttttttg 131400

gtttttgttg ttgtcattgt ttgagacagc atcttgctct gtcgcccagg ctggagtgca 131460

atggcacgat cgtggctcac tgcaacctcc acctcccggg ttcaagcaat tctcctgcct 131520

cagcttcctg agtagctggg attacaggca tgtgcaacca cacctggcta atttttgtgt 131580

ttttagtaga gaaggggttt caccatgttg gtcaggctgg tattgaactg ctgacctcat 131640

gatccacctg cctcggcctc ccaaagtgct gggattgcag gcatgagcca ctgcacctgg 131700

ctgaatgtct tgtttttgat taggcactta agaaaggcct aggtactaac cataaaatat 131760

atttttatac cttttgttga tactatatat atagaaaact gcacttatca taaccttaga 131820

caccttgaag aatgttcaca agcagaacta acccatgtga cccagcatcc agatcaaaaa 131880

cagcattatc agcccctcta gaagccctct tgggcccctt ccattcactg tccttcttgt 131940

caccagggta gctactatcc tgacttttga tggcatagat tagcattacc tgttcttgtc 132000

attttataaa taaaaccata ctgtgtattc ttttcttgta cagctttatt gtgctaattc 132060

acatttacat catacaattc agtggttttt atatggtcac agagttaggt aaccattacc 132120

acatcgattt tagaacattt ttttcactcc agatagaaac ccccttttact taaactccaa 132180

atcccccact ccaccagccc taggcagcca ctagtctact ttttatctct atagagacaa 132240

tagatttgct tattctggac atttcataaa catggaaccg tatattatgt ggtcttttgt 132300

tgccaactgt ctttcactta gcatcatgtg ttcaaaagag catcatgtta tccatgtttg 132360

gcatgtatca gaattttatt cctcattatg gccaaatatc ccattgcaag gatttatgac 132420

attttatttg aattgtaccc tcctttctgc catttatcaa taatgctact gtgaccattt 132480

gtgtacaagt ttttgtgtgg atacaggttt tctttttgtt tttaaatttg aggtggagtc 132540

ttgctctgtc gcccaggctg gagtgcagtg gcacaatctc ggctcactgc aacctctgtc 132600

tcctgggttc aagcagttct cctgcctcag cctcccgagt atctgggact ataggcacgc 132660

accaccacgc ccagctaatt ttttagtaga gatggggttt caccatgttg gccagtctgg 132720

-continued

tctcgaactc ttgacctcaa gtgatccacc catctcggcc tcccaaagtg ctgggattac 132780

aggggtgagc cactatgccc ggctgtggtt ttcatttctt ttgttgtata tacataggag 132840

tagaattgct gagtcaagag gtaactctta aacttattga aaaactgcca gattgttttc 132900

cgaaaaggct gcaccatttt gcaatcccac cagcagtgta tgagttttac agcttctcca 132960

catttcattg gaacttatta tctgtttggc tgtttttaaa aatgatagtc attccaataa 133020

gttctacttc agtgtggttt ttgcacttct ctgatgagta atgatgttga gcatcttttc 133080

atttgcttat tggcctttgt tctagctttg gaaaaatgtt tattcaaatc ctttggccat 133140

ttttattttt atttttattt atttattttt ttttgagacc aagtctcact ctgtcagcca 133200

ggctggagta caatggtgtg gtctcagctc actgcaacct ccgcctcctg tgttcaagtg 133260

attctcctgc ctcagcctcc cgagtagctg ggattacatt tcaggcacct gccagcatgc 133320

cgggctgatt tttgtatttt tactagtgac agggtttcac catgttagcc aggctggtca 133380

caaactcctg acctcaggtg atctgcctgc ctaggcttcc caaagtgctg ggattacagg 133440

cgtgagccat tgggcccagc ctagattttc ttttttcttt ttttttttga gaaggagtct 133500

tgctcttgtt gcccaggctg gagtgcaatg gcacaatctt ggctcactgc aacctctgcc 133560

tcctgggttc aagcgatttt cctgcctcag cctccccagt agctgggatt acaggtgcct 133620

accaccacac ccagctaact tttgtatttt ttttagagac agggtttcac catgttggcc 133680

aggctggtct caactcctga cctcaggtga tccacctgcc ttggcctccc gaagtgctgg 133740

gattaccggc atgagctacc aggcccagcc aattttctca ttatattgcc caggctggtc 133800

tcaaactcct gggttcaagt gatcctcctg ccttggcctc ccaaagtgtg gggagtacag 133860

gcgtgagcca ccttgctcag ccccttgcc cattttaaa ttagattgcc tttttatatt 133920

gagtttcagg agtcctttat atattctaga taaatgtccc ttatcaaatt atattatttc 133980

caggtatttt cttcattctg tgagttgtct ttcctctacc ttttaaaaaa ggtgggtttt 134040

tgtttgtttg tttgtttgtt tttttaagat aaggtctcat tctgctgccc aggctggagt 134100

gcagtggcac aatcacagct cactgccacc tcaacttcct gggccgaagt gatcctctta 134160

cttcagcctc ctgaatagct agggccatag atacacacta tcacacccag cttttttttt 134220

ctgtttgtag agacagatct tactgtgttg cccaagttgg tctcaaactc taggctcaaa 134280

gtgattctcc cacctctgcc tcccagagtg ctgggattac aggtgtgagc cacacgcaac 134340

ctgtcttttc actattaata gtgtcttcct gcttcagcct cccgagtagc tgggattaca 134400

ggcacccacc accatgcctg gctaattttt ttgcattttt agtagagaca gtgtttcacc 134460

atgttcaccc ggctggtctt gaactcctga cctcaggtga ttcacctgcc atggcctccc 134520

aaagtgctgg gattacaggc gtgagccact gcacccggcc aaaatattgc cttcttaaca 134580

gtattgtctt ctaatttgtg aacatggatg tatcttcatg tatttatgtg ttctttcatt 134640

tcagcagaat tttgtagttt tcagagtaga agcctttcac ctccttgggt catttattcc 134700

tatgttttaa gttcttttcg attccattat aaatagaatt gttttcttaa tttcattttc 134760

agattgtttg atgagagagc atagaaatac aagtgatttt tacatgttga tcttgcaact 134820

tcaactttga taaatctgat tgttagctct aatagttttc ttgtggattc tttaggattt 134880

tcaatatata agatcatgtc atttatggat agagatagtt ttttttctgg ctagaactta 134940

cagagcaatg atgagtagaa gtggcagaag caaaaatctt tgtcttgttt cctatctgac 135000

-continued

agggaaagct ttcagtttca tcatttaata tgatgttagg tgtgggtttt caataaatgc 135060

cttttttcag attcaggaat ttccctatca ttcctgattt tttaaggctt ttttttttt 135120

ttaaatcatg aaagggtgtt gaatattgtc atgttctttc tgtatcagta taaatgatcc 135180

tatggatttt gggttttatt ctgttgatgt gaaatattaa ttgattttca gatgttaaac 135240

caaccttgca tacctgagat gaatctcact tggtcatggt gtataatctt ttcaatatgc 135300

tgctggattc catttactgg tattttgttg aagattttgt atctgaacgc ttaagataac 135360

atttacactc tatcagaaat gaattgacca taaatgtgag agtgtatttg tgggttcttg 135420

attctcttcc attccaaaga tagacataca tccgtctgta tgtctgtctt tatgccagta 135480

ccatactctc ttgattacta ttgctttgta ataagttttg aaatcagaaa gtataaatga 135540

gattttggta tctgagtaac agtcctcata gaattagttg ggaaatattc cctctttatt 135600

ctggtccctc tttctttttt gtttaactgt gtatcttgga gattgttcct tctcaacaca 135660

tgagagccgc tttccctacc ctcccacccc tgctatagag aggtctataa gtgtctgttc 135720

aattatttta tttacttaac ctattactta gtcggggaca ttaagcttgt ttatgtcttt 135780

tattttaaac aatgctgcag tgaataatct tgtatataag tcattttcca tcaatataag 135840

tctctctgta actgaatttt tagaagtgga atttctaggt caacctatgg ctctgtattt 135900

cacaaaaata ccaattctgg tttttcttgt ggaggtgggg agtaggaggt agaatgctgg 135960

aggagaactt gctgtactca gctggctagt cattttagaa aggtttcctt agcttctttt 136020

tgtcatatgg cctcaccaag aatcaaaaac attcctattt accctgtaaa catggggctt 136080

tactacccaa gatacatatt tctggatgta tgacagcttt tcatattgaa gaaataatgc 136140

tgtgagtaca gcacatttgt tggaacttag gtcgttaaga atgtcttata aattcataca 136200

ttatacattt tattttattt tatttttag tttttgatac agagtcttcc tctgtcgccc 136260

aggccagcgt gcagtggtac aatcttggct cactgcgacc tccatctcct gggctcaagt 136320

gattctcatg tctcagcctc cagagtagct atggttacag gcatgcacca ccatgcccgg 136380

ctaatttttt tatttttagt agaaactggg tttcaccata ttgaccatgc tggcctcgaa 136440

ctcttggcct caagtgatcg gcctgcctca gcctcccaaa gtgctgggat ccttgtattg 136500

ggtaaaagat gaatattgag ggctgcatgg tggctcatac ctgtaatccc agcactttct 136560

gagactgagg tgggaggagt cctggagccc aggagggtga ggctgcagtg agttgtgatc 136620

gcgccattgc acttcaacct aggaattata ggcttcagtc actgtgcccg gcatgtacat 136680

tttaatattg tgctttcctc ttttagctat agtatgaggt tacatttcag agtcattgtt 136740

gttaagcatc ttaatagtga tgaggttgag tgaaagttac ttctatttca aacactgaag 136800

aaaattttgt acaaatctgt cacattccaa gcccaggact gattgtttca tatacttcta 136860

attttacaat ttctattgta gtccagtgtg aaaaaagcca gtattaaaat actgaaaaat 136920

tttgatgaag cgataattgt ggatgcggca agtctggatc cagaatcttt atatcaacgg 136980

acatatgccg ggtaagctta gctcatgcct agaattttta caagtgtaaa taactttgca 137040

tcttttaaat tttttaatta aattttacat ttttttctaa tctattatta tatgcccaga 137100

actttcactt agagtgtgca gtataatgtg gtggttaagt ataaaggctc tggagtgact 137160

tcctgggttt taatcttggc tctgccattt attggcagcc gctaacctct tggtatctca 137220

gtttcttcat ctgtaaaatg agaataataa agtgaaaaga tgccaacatc atttactctg 137280

-continued

ggctgcataa ctgatacttg gaaaaagtat tcctttgagt ttaagaatta agttggttat 137340

tcattttagc ttgtaataaa aagatagtga ttcataggat atgccactta ctgaaattta 137400

ccacagatcc aatcataaaa tcactttctc ttccctaaag atagcttgat taacatgtaa 137460

aggtgtgtaa aggcttgatt acactaccct gatccgtacc ccagttccca gcagcaccat 137520

gaaaaaggga tttcaacata tttaattact ttcagtagaa agtaacagtg gtaggccagg 137580

cgcagtggct cacacctgta atcccagcac tttgggaggc cgaggtgggc ggatcacgag 137640

gtcaggagat tgagaccatc ctggctaaca cgatgaaacc ccgtctctac taaaaatacа 137700

aaaaattagc cgggcatggt ggcaggcacc tgtagtccca gctacttggg aggctgagac 137760

aggagaatgg cgtgagcccg ggaggcggag cttgcagtga gcttagattg tgccactgca 137820

ctccagcctg cgcagtggag cgagactctt gtctcaaaaa aaaagaaagt aacagtggta 137880

ttgggagact gaggagccta gaaagtactt gaaggaagta aaaggtttgt ttgaccacat 137940

tgtatttgga aagccagctt tttcagctgt gtcagctttg tgtagtgatt tttagttctt 138000

cttttagaaa ataacggaca aggccgggca cggtggctca cgcctgtaat cccaccactt 138060

tgggaggccg agacgggcgg attacctgat ctcaggagtt cgagaccagc ctgggcaaca 138120

tggtgaaacc ccgtctctac taaaatacaa aaagttagcc gggcgtggtg gcgtgtgcct 138180

gtagtcccag ctactccgga ggctgaggca ggagaattgc ttgaacccgg gaggcggagg 138240

ttgcagtgag ccaagatcac accattgcac tgcagcctgc gcgacagagt aagactctgt 138300

ctcaaaaaat aataataaaa taaaaaagaa tggacagtaa acctaaatga gttcattccc 138360

aaagatgatg ttattcttaa gggatggttc atttatttaa gaccttacat aaagtctatc 138420

aattgcgtga tttttcactt ctgtaattgt gtgtatgtat aatgtaaata tatatgtttt 138480

tgttttgttt tggtttttтg agacggagtc tcgctctgtt gctcaggctg gaatgcagtg 138540

gtgcaatctc agctctctgc aacctctgtc tcccaggttc aagcgtttct tctgcctcat 138600

cctcccaagt agctgggact acaggcacgt gccaccacgc ccggctaatt ttttgtattt 138660

ttagtagaga tggggtttca ccgtgttagc caggatggtc tcaatctcct gacctcgtga 138720

tccacccgcc ttggcttccc aaagtgttgc tattacaggc atgagccacc acacccagca 138780

tgtatttttt aaatgtataa aatgaagcag aaaagagaaa tgataatttt tcttcatctt 138840

gaaagattat cttcaccagg cgcagtggct cacacttgta atcccagcac tttgggaggc 138900

ctcggcaggc ggctcacttg agttcgaaac cagcctggcc gacatggtga aactccgtct 138960

ctactaaaaa taaataaata aagatggttt taatatatgt tttagtttta tgattttagc 139020

atctttctga aatttttctc aaggcaagta aatttgtatc agttggtata ttggtaccca 139080

tctatgaaat aacttattag gaagatatct ctaaaataag atcactttgc ctaaaataaa 139140

ctgatatatt gatgttcaca gaatttttct tttaaccgac ttgataaatg cattattctt 139200

gacgtcaagt gatccacctt cctcagcctc ccaaagtgct gggattacac acatgagcca 139260

ccgcacctgg cattattctt ataaaaggtt aaatttctag ttaagtttaa tgtcctcttt 139320

gttcatgtac cattgcttat tttcttccct tcctactcac agtaatcatt cttatggtat 139380

gcacttttgt ttgcttattt ttatgtaatt gatattacgc tccattctgt acgttgtact 139440

ttcattcaca gtgagttttg gacattccta tgttcatcta tacagactta cttcatttta 139500

actacactgt agtattccgt atgtaatatt tactataact catcactgta gcagagcatc 139560

-continued

tcatagtgta tgtattactg ttttgccatt ttggtatcaa tgagtattta agtcatttgc 139620

agtttttccc tcttataccc agtattacag aggatctctt tttatatgct tctttgtacc 139680

aagaggcaga ttaaaaaatt ttttttgaa aaaatttttg aaaaaaaatg aaatgaagtc 139740

tcactatgtt gcccaggctg gtctcaaact cctaggctca agcaatcctt ccatcttggc 139800

ctcccaaagt gctggggtta caggcatgag ccaccatgcc tggcctacat tttaaatttt 139860

gatagctctt acaatttact ttgtaaagta tctgcatcat tttatgttct caccagtctt 139920

taataagaat acttcatact tttggctgga cacagtggct cacgcctgta atcccagcac 139980

tttgggaggc cgaggcgggc agatcaagag atcgagacca ccctggccaa tatggtgaaa 140040

ccctgtctct actaaaaata caaaaattag ctgggcgtgg tggcgcaccc gtagtcccag 140100

ctactcgaga ggctgagaca ggagaatcac ttgaacccgg gaggtggagg ttgcagtgaa 140160

cttagatcac accactgcac tccagcctag caacagagtg agactctgtc tcaaaaaaaa 140220

aaaagaatac ttcagactta attttttttc cagtcttaag tgtttgctaa tgagattgag 140280

tttcttttgg tatgtctctt gattgttcag gtttttttctt ttatgaattg actgttcatc 140340

tctttttcac attatttctg ttgggtgatt ttattagtga cttgttaaaa ttctgtatat 140400

tttttcagca tgacacttca ttattcaaaa aaaaaaaaag attctctatg tttctcgata 140460

ctaatcattg gttggtaata ccttaaaaat aagaccctta ctgtattttt tgcttttttt 140520

ttttttttttt ttttttttttt tttgagatag agtcttgctc tgttgcccag gctggagtgc 140580

aatggtatga tctcggctct cagctcactg caactgcaac ctctacctcc ctgtttcaag 140640

caattctcct gccttagcct cccaagtagc tgggattaca ggcatccacc accacaccca 140700

gctaattttt gtatttttag tagagacagg gtttcaccat gttggccagg ctggtctcaa 140760

actactggcc tcaagtgatc cgcctgcctc ggcatcccaa agtactggga ttacaggcat 140820

gagccacagt gcctagccac tttttgcttt ttaactttgt tttatagtac tatagtttta 140880

gtataaacag atgtatgtat acacacaact atggctttat aatatgtttc agtcattgtt 140940

agagcaaggc ctacctttg ggtgcttctt ttacaaaatt gtcttggcta ttcttgtgcc 141000

ttttttctta tttgtgaatt ttagaattgt gaattacctg ttgactcacc atgttttgta 141060

aactgaggat tttgaatgga attgcactca attaaagatt atcttgcttt ctgtgcagca 141120

atgttttatt tcaaataatc cctactttaa attacttagg atagctataa attgtgtttc 141180

tggctttcta gatttagatg aaacgcttta aattgattgt tttctcctaa atttaaaact 141240

gattgttaga agttaaagtc ttctgttcat tcttatttag gaagatgaca tttggaagag 141300

tcagtgactt ggggcaattc atccgagaat ctgagcctga acctgatgta aggaaatcaa 141360

aaggtttgtg gtgtttttat acttcatatt aagcctttac tcacattagt gattgactgt 141420

aagtcaaaga ccacttaagg tttaaactgt ttattttgta aagtaaccac tgtatctttc 141480

accttgtgtt tatagtcaga agtaagtaca agggcttcct gtagtcacat ctttatgcaa 141540

tctcctctga atcaaaagtt agtgaacttg ctttgccact ccagaaggca catgaatatg 141600

aaaaagcatt gtctattttc ttatttaatg gcaaaatacc cgacctaagt tggacttaat 141660

gtttgagacc gtttatttta ttaaattata ttttttctct tttcttttttt ttttttgaga 141720

cagttcttgc tctgtcaccc agaccggagt gcagtggtct gaccgcacct cactgcaacc 141780

tctgcttcct aggttcaagc gattttcctg cctcatcctc ctgagtagct gggactacaa 141840

-continued

gtgcgcacca ccacacctgg ctaatttttg tatttttagc agagatgagg tttcaccacg 141900

ttggctaggc tggtctcata ctcctgacct caagcaatcc atccgccttg gcttcccaaa 141960

gtgctgggat tacaagtgtg agccaccatg cctggcctta ttaaattatt tttattaaat 142020

ttcctcaaga ttgatgaaag taatgaaata taaaagtaat gaaatatatg tggaaaatag 142080

actggattaa gaaaatgtgg cacatataca ccatggatac tatgcagcca taaaaaagga 142140

tgagttcatg tcctttgtag ggacatggat gaagctggaa accatcattc tgagcaaact 142200

gtctcaagga tagaaaacca aacaccgcat gctctcactc ataggtggga attgaacaat 142260

gagaacactt ggacacaggg tggggaacat cacacgctgg ggcctgtcgt ggggtggggg 142320

gctgggggag gaatagcatt aggagatata cctaatataa atgacgagtt aatgggtgca 142380

gcacaccaac atggtacatg tatacatatg taacaaagct gcacgttgtg cacatgtacc 142440

ctagaactta aagtataata aatttaaaaa aaataaatat atgtggaaaa tattaatagg 142500

tcaaaattca aattgttcat ttaatcagaa gagtagttta gtcaaatcca agggttagac 142560

aacagaaatc ttttttgtca agtgcattct ttgtgactga tttcattttc ttcctggttt 142620

acacaggaag atttcagaaa caaatgtgga tccgtgacag atggtatcta gaagttttta 142680

gtttggttga attgacagta ttttattgag taaaagatac taatttttgt aagaagaaaa 142740

attcaatttt gataagtatg tttaagatta agagctattg gccaggcgct gtggctcatg 142800

cctgtaatcc tagcactttg ggaagctgga gcaggtgggt cacgaggtca agagattgag 142860

accatcctgg ccaacatggt gaaaccctgt ctctactaaa ttagccaggc gtggtggcac 142920

atgcctgtgc acccgcctcc gggtttaagc gatcctactg cctcaggctc ctgagtagct 142980

gggattacag gcgccatggc taatttttgc atttttagta gagacagggt ttcactacat 143040

tggccaggct ggtctggtct caaactcctg acctcaggtg atctgcccgc cttagcctcc 143100

caaagtgctg ggattacagg catgattcac catgtctggc catttatctt attttctttt 143160

ttttttttct ttttgtttga gacggagtct tgctgtgtcg cccagagctg gagtgcaatg 143220

gtgcgatctc agctcactgc aacctctgcc tcctgggttc aagcaattct cctgcctcag 143280

tcttccaagt agctgggatt acaggcgcgt gccaccacat ctagctaatt tttgtatttt 143340

tagtagagac agggtttcac catgttggcc aggctggtct cggaactcct gacctcgtaa 143400

tctgcccacc tcggcctccc aaagtgctga gattacaagt gtgagccact gtgcccagcc 143460

atcttatttt ctttctttct ttttgtcggg tgggaggggg acagagtcta gctctgtcgc 143520

caggcttggc tcactgcaac ctctgccccc caggttctag caattattct gcctcagcct 143580

cccaagtagc tgggattata ggcacctgcc accacgcctg gctaattttt tgttattttt 143640

agtagagatg gggttttgct atgttgacca tgctggcctc aagtgatccg cccaccttgg 143700

cctcccaaag tactgggctt acaggcgtga gcttgtattg ggtaaaagaa caatattggg 143760

ggctgcatgg tggttcatac ctgtaatctg agcactttgt gagactgaga tggaaggagt 143820

gttggagccc aggagggtga ggctgcggct gcagtgaatt gtgatcacgc cattgcactt 143880

ccacctaggt aatggagcaa gaccatgtct ctaaaaaaca aaacacaatt tttttaagga 143940

atactgggaa gaggtcagtg gtggttttag aacagaggaa gtgccagatg acctttgtga 144000

ggcattggcc aggaagaact ctacagtgtc tttaggtagc ttctgtccat aaggataatg 144060

gggtctcctc cccagtatta atagaaaatc tctgagctgt tttttttttgt ttgtttgttt 144120

-continued

tgtttttttt tcctgagatg gagtctctct ctgtcggcca ggctggagtg ctgtggcgcg 144180

atcttggctc actgcaagct ctgcctccca ggttcacacc attctcctgc ctcagcctcc 144240

caagtagctg ggactacagg tgtccaccac cacgcccagc taatttttttg ttatttttag 144300

tagagatggg gtttcaccat gtcagccagg atggtctcga tctcctgacc tcgtgatccg 144360

ctcgcctctg ccttgcaaag tgctggagtt acaggcgtga gccaccgtgc ctggcctggt 144420

ttttttgttg ttgttattta tttatttatt tatttatttt ttgagacaga ctctcgctct 144480

gtcgcccggg ctggagtgta gtggcacgat gtcggctcac tgcaagctct gcctgccagg 144540

ttcaagccat tctcctgcct cagcctcctg agtagcaggg accacaggcg ctcgccacca 144600

cgcccggcta atttttttgta tttttagaag agacggggtt tcaccgcatt agccaggatg 144660

gtctcgatct cctgatgtcg tgatccgccc acctcggcct cccaaagtgc tgggattaca 144720

ggtgtgagcc accgtgcctg gcctgatttt tttttttttt taatctggtc tcatacctct 144780

gacagctcat gaagaagtgc tcctgcttca tatgtatatg tgttagcata gtgttaacat 144840

agcataggtg ttcggtgttt gcagtttctg tttgttttat atgaattaag gtgtattatg 144900

agcagttgaa gatatatagg aaatttttttc ccaaaccact atctctgctc gttctattca 144960

ttcagtctgt ttatgttatt ccttcattca ttcattttat agaacagtgg agtgcctact 145020

gtatgcatct attgttctgg gtcctgggga agaaaacaaa gttcctgctt tcatggaact 145080

tacattatat tggcggagac agtaacagac aaacaaatgt agcctgtgta catgtgttac 145140

atgaaaagca gggtaggggg ctgggagaga gtagtaggga gtgctatttt cgaggtggtt 145200

gtcaggaaag gcctcactga ggaggtggca ttttgagtag acctgagcgc agcgggggcg 145260

taagcccagg cagcatgtgg aggaagagtg ttcttggtga aaggaacaag gatagaggcc 145320

cgaagctaga gagctcagca tgatcaagga acagcaagcc ccgtgtggct ggaatggagt 145380

gagcaaagga atgagcagta gaaggtgagt gagttgggag gtcaccagag accatggcaa 145440

ggacttgaaa gtgtcaggga cacattggaa gttggagcag ggaaatgatg ggatttatgt 145500

tttgtttttg ttttatgttt agtgttttta agggattgct ctatcagcta tttggaaaat 145560

ttagtgtagg gcttcaagaa gagaagcaga gaaacaacat tcttgccata gtcatagtct 145620

aagtaaggga tgatggtggt gtggattagg ctggtagtgg aagaccagtc cagttcgggt 145680

tgtatttgaa ggtagaggca aaaagattat atttctacca gcaagcccat ctatgaagtt 145740

acttgtatta ttaatttaat tgagacatgc ccacataaac taataaatag gaatttctgc 145800

agtttggtta aacacccctg tatatcctgg ttcttctttt agttgtccag atgtctcttt 145860

aagtcaagta ttttttggtg gtgtaggagc ctagagattg aatttattca cccaaaaggc 145920

atttgagtga ttactatgtg ccaggcacta tgctgaatgc caaggatgta aataagaggg 145980

cgtagtctca gtctgtttta ctccagcttg gttccttttt aatgaccctg acttgttaag 146040

catatcagtt atcctacaga atgtttaatc ttctgtactt tcctggttgt gttatttagc 146100

ttatttctct ttccttgaca tttcttgtaa actggaagtt acacctatag tcttgatgat 146160

tcgtgttaca cattttagat tagaacacat catgtgttgt atatggtgtt tttgaaagcc 146220

tctctgtata ttggtctgta cattaaaatg ttgcctgaat ggatacacat aaaatttaac 146280

agtgattaca ttagagatga gaagaaagag gtgcctttta cttttcaata taccttttcc 146340

tctgcttttt gaactttctt gccctatgca tacgttattg cttaatcatc cacctcatct 146400

-continued

cttcccctgt ggctttctgt tgcatttgga atgaaatcta gcctctttgc tgttacctgt 146460

ggatgtccct tgctggcctc tatcacctta ctttgaacca ctcctttcat ggactgagct 146520

ctcattggac tatcttttat tcttttgctg aagtttcttc actttgagtg cctctgcagt 146580

tgctatttca tggctgtggc aagccctgcc atggctttca tgcaaggatg gttcctcctt 146640

ctcatctcaa tattatctct tcagagaggg accttcccaa ctccgatgat ctaaaatcct 146700

ttgtatatac cactcactac cacttctttc ttttcttttc cttttatctt ttttttttt 146760

ttttttttt gagatagggt cttgctctgt tgcccaggct ggaatcacga ctcactgcag 146820

cctcatcttc ttgggctcaa atgatcctct cacctcagcc tctcgagtag ctggaactgc 146880

aggcacacac caccatactt ggcttattat tttacttttt gtagagacag ggtttcacca 146940

aggctggtct caagctcctg ccgcaagcaa tccacatctc tcagcctccc aaagtattgg 147000

gattatagga gtgagccact actcctggcc tattttctta ttcactgtct aaaattatct 147060

tgttcattta tttacatact tgtttatagc ttatttctca gctggacatg gtgcctcaca 147120

cctgtaatct caatactttg ggaggctggg ttggagaatt ggttgagccc aggacttcaa 147180

gaccagcctg ggcaacaaag tgagaccctg tctataaaaa attgtttaaa aattagctgg 147240

gcatggtggc acatgcctgt ggtcccagct acttgggagg cagaggtggg agaatcgctt 147300

gggcccagga ggttgaggcg acggtgagcc atgattgtgc cactgcactc tagcctagtg 147360

acagagtgag accatgtgtc taaaaagtaa ataaaaatag tttctctttc atgactagaa 147420

tattacctct atgtgggcag ggagtttgtc tatactattt ggcactatat ttcctgattc 147480

tgaaattatg cctagcacat ggtaagtact ccttaaatat ttattgactg aattatttaa 147540

tacttaagaa tttcatttgg gattatctga gtggtaagat tacggattat atttatgtaa 147600

gaaaaaatca ttttttaaac ttggttgccc tttgccacac tgacatagac actaagtttt 147660

cttagccaga ttacttccga ggatactcac agaggccatt ctcttctcaa tccccaaata 147720

attgatattt cttagcactt tcaagctaat gcaattctta gatgatgtat ctgtgtatat 147780

catatcctca ttctacaaat gtagaaattg aagtctgggc acagtggctc tcacctgtaa 147840

tctcagcagt ttgggaggcc aaggcgagcg gatcactgag gacaagagtt aagaccagcc 147900

tggccaacat ggtaaagcct tgcctctatt aaaaatacaa caattagggc cgggcgtggt 147960

ggctcacgcc tataatccca gcacgttggg aggccaaggc aggcagatca cgaggtcagg 148020

agttcgagac catcctggct aacacagtga aaccccatct ctactaaaaa tacaaaaaat 148080

tagccaggca tggtggcacg cgcttgtagt cccagctatc gggaggctga ggcaggtgaa 148140

tcccttgaac ccgggaggcg gaggttgcaa tgagctgaga ttgcaccgct gaactccagc 148200

ctggtcaaca gagggagact ctgtctcaaa aaaaaaaaaa aaaaacaatt agccaggcgt 148260

ggtggcgggt acgagtacct gtaatcccag ctactaggga ggctgaggga ggagaatcac 148320

ttaaacccag gaggtggagt ttgcagcggg ctgataatgc accactacat tccagcctgg 148380

gcaacagagt gagactctgt cttaaaaaaa aaaaaaagaa agaaagaaat tgaggaatgt 148440

ggagattgtg gtctgtgatt tgttaggaat cacacagcag gttagtagca actacagggc 148500

tttggttcag aataccacct tgacaatggt ttgtttacag ttcggctccc cttcctctgc 148560

ctttctctcc ttccttattg agggcagctg gaaagaattt tcatcattta ctagcctata 148620

gctttaattt gagttttgaa accttgataa tagagcacag aggaaaagac tgagttttct 148680

-continued

```
ttttttgaga cagtcttgct ctatggccca ggctggagtg cagtgacacc atctcagctg 148740
gttgcaacct ctgcctccca ggttcaagca attctgcctc agcctctcga gtagctgaga 148800
ttacaggcac gtgtcaccac gcccagctaa ttttctgttt ttgtttcgtt ttgtttttt 148860
ctgagatgga gtcttgctct gtcacccagg ctggagtgca gtggtgcgat gttggctcac 148920
tcaaacctct gtctcctggg ttcaagcaat tcttctgcct cagcctcccc agtagctggg 148980
actacaggta cgtgccacca tccctagttc atttttgtat gtttagtaga gatggggttt 149040
cactatgttg accaggctgg tctcgaactc ctgatctcag gtgatctact cgtctcagtt 149100
tcccaaagtg ctgggattat tggcacacgc ctatttttgt atttttagta gagacggggt 149160
ttcaccatgt tggttagact ggtctcaaac ttctgacctc aagtgatttg cccgccccag 149220
cctcccaaag tgctgggatt acaggcgtga gccaccgtgc ccagccaaga ttgagttttg 149280
aaaagagcct tctgagatta tgagaagggc aagcaagata acttaagaag ttacattaaa 149340
atcatctaag agacagtgta acaagaagga attgtaaaat gatgttatga gcacgtgccc 149400
aatgtagtgg caatcccttg tgcttcgata cattggtggg agacaaaact gtacttaaat 149460
tgataaatcc cttacatgtc attttaagga gcttagactg actcccatca tgtagacatc 149520
agagatttct ttttttttt ttttttttt ttttttttt tttgtgacag agttttgctc 149580
ttgttgccga ggctggagtg caatggcgtg atctcggctc accacaacct ccacctccca 149640
ggttcaagca attctcctgc ctcagcctcc cgagtagctg ggattacagc catgcaccac 149700
cacgcctggc taattttgta ttttagtag agacggggtt tctccatgtt gtggctggtc 149760
tcgaactcct gacctcaggt gatcctcccg cctcagccac ccaaagttct gaaattacag 149820
gcgtgagcca ccgcgcccag cccagagatt tctaaacaga gttctaacca gatgcttttc 149880
cctgtcagta gaatgagaat gaattggagg tgggagagac tggcatgagg gacaccagtc 149940
agccagtgga attagctggt aatgttgata ggagaagaaa aagattcaaa gttaggtagt 150000
ggtagcaaga attagaggga aggtcggatt tatgatatgt ccaaggttga attctaaggt 150060
gaaatttggt ggcagatttc atgtgtaaat tgggaaggta gattgagttt ttttaacatg 150120
ggttttctaa catgtcaata gagtgactct gcaggggggc ctgacgagag aacagtgcat 150180
ggggtgattc aacagccagt tgagccttca tgcagagcat ttaacactgt gactctgtag 150240
actctggttg gcagtaaaat ttcattaaac caatatttaa acccttaggt aataataaaa 150300
attgagggaa aaggatccag gttttgtatt ttttatgaat tcagttattg aattaaacag 150360
gaccttgcct caagaaataa tctaccaaca attaacttgt tttaaagcaa agttaggaag 150420
tgagcatgtt caaattatta aataaaaaag taagctgtgt atttcattca tagaaataga 150480
ggctggccta cttcggatga ttctcagcat gtgattacag atgtgggctt atacatccta 150540
gggagttaag gcgtactctg gcttggatag agtagagctc tttgaaactc ttctctcacc 150600
cagctagttt atatagacta gagaactaga atgtagcagc atactctgtc ttagaagccc 150660
ttttatatag gagctggtct ggaaggtttg aaaacataac aaatgtgttg gtgtctccca 150720
atgtattgct agattcttac ccaagagcat tatcctggtt agggtttggt ttggttttgt 150780
tttgtttttt aatgtttgcc acaaactaac actagatgtt agttctttca tcaagtgagg 150840
agagtagaag aaaagtccag aactctgaaa caccttttca aaagtttttc aagccatgat 150900
gtttgcaagt taaatgctct gttatgtaag caatataatc agtttttatt aatgtaacat 150960
```

-continued

tccttagtgt tttggggtat cacacaaaaa agaatatcca tatctggaag caacagcttt 151020

taaataagag cattgtggtg gtggtggtga tagtggtttt ttttttttt tttgagttgg 151080

agtctcgctc tgttgcccag gttggagtgc agtggcacga tctcagctcg cttcaacctc 151140

tgctcccagg ttcaagcaat tcttctgcct cagcctcctg agtagctggg attataggca 151200

cctgctacca tgcctggctg atttttatta ttttagtaga gacaggtttc accatgttgg 151260

ccaggctggt cttgaactct taacctcagg tgaatcaccc acctcggcct cccaaagtgc 151320

tggaattaca ggcatgaacc accatggcca gccaaataag agcatttta atgtaaaatt 151380

atgcatgaaa tgtacattca attttgtctt tgtttactag gatccatgtt ctcacaagct 151440

atgaagaaat gggtgcaagg aaatactgat gaggtaaatc ctacctttag gataaaaaga 151500

tttctgttta taagtgccac cctcatgtaa gtgaggttta aaattttcct tttctttagg 151560

tcccatgttt aagcagcatg gcacatttat gttctcttac ccagaatgta ccaagaaagg 151620

gtggtccctt cttaacatct aacaattgcc tggtagtagc agtgaaggta tcttcagtca 151680

gaggctagga ccactgaagg atatacatgc attcaagttt ccatcagcca gcaggcatca 151740

gtaatcagtg tgtagatcaa aagctcaaat gtttccttcc ccactggcag ttttacttca 151800

agtagtggag gcttgctttt ttaatagtta attaagtaca ttgagagatg ggaggtgaaa 151860

aaaggaaaat gttttatttt gaccatctaa tatgaaagta gttcggtgtt aggtatccag 151920

tagttgacac tggaagacag ggaatgacat gttaatattc atagccagag ggtggcccag 151980

gtttttttcgt acatgggaat gaaattctta tccaaataag tagaaattat gtgcgtaagc 152040

catttgttaa gagcactgag tatgtgcatc tcgatccatc taatgaataa ccattatcac 152100

cagtttaaat tattttcttt aggcccagga agagctagct tggaagattg ctaaaatgat 152160

agtcagtgac attatgcagc aggctcagta tgatcaaccg ttagagaaat ctacaaaggt 152220

aaggatgact tcgttttgtg taaactaaaa agtattattt tccaggtgta aaaataaaaa 152280

agaacataag gggtttcttt gcctttgaag gattaactgc tgtggggatt accttcttat 152340

cataagcaac tagaaaattg acaaactaaa tgaaacaact gtttgcatat attggacaat 152400

gggcaataca gggaaaccat ggaaaccaaa cagagcccag tagtcttgct gaacgaaaga 152460

gttaaatatc aaagttcagg ccaggtgcag tggctcacgc ctgtaatccc agcactttgg 152520

gaggccaagg cgggtgaatc acttgaggtc aggagttcaa gaccagcctg gccaacatgg 152580

tgaaaccctg tcttagccgg gtgtggtggc aggcacctgt aatcccaact atttgggagg 152640

ctgaggcagg agaatcgctt gaaccaggga ggcggaggtt gcagtgagcc gagatcacac 152700

cactgcactc cagcctgggc gacgagcgaa accccatttc aaaaaaaaaa tcaaagttca 152760

gagagctcaa tttgagtaga agttgtagga taaggtagca gaaaagagga agctgcccag 152820

aaagaaagcc gtagagatat ttagagagat tcccatggat ccttggccta ggagtgatct 152880

gtatatgtgt ggggtgaaaa cgcatgtgtc caggtagaga acccccccaga aattagtagg 152940

ctgaatgatt gctggaacat agggctaaga aaagttcatg gccagaagga tctggccaga 153000

gtagagagac ttagtaatac acaaggcatt gggtagtgtc ttcacagagg ttatgcctta 153060

ctactgaaga taaattagtc ctagagtaca agcacctgaa ccaagtttca aagcaaattt 153120

ttaaagggtc aaattaccta acaactgcat gccaaaacaa aggcctaacc ctctttacag 153180

taacacaaca aaattcagca cttcacagtg taaagttaga atgtctgacg tccaggctgg 153240

-continued

gcgcagtggc tcatgcctgt aatcccagca ctttgggagg ccgaggcagg tagatgacct 153300

gaggtcagga gttcaagacc agcctggcta acatggtgca accccgtctc tattaaaaat 153360

acaaaaactt agccaggcat ggtggccggc acctgtgatc ccggctactt gggaggctga 153420

ggcaggagaa ttgcctgaac ccaggaggtg aaggttgcag tgagccgaga tcgcaccact 153480

gcactctggt ctgggcaaaa agagcaaaac tcaggctcaa aaaaaaaaaa gaatgtctga 153540

cgtcaatcac aaattaccaa gcatgacatg aagttgacct ataaccagga gaaaactcaa 153600

tctatagaaa cagacccaga tgtgagaaag atgatgaatt tagcagacaa agaccatcaa 153660

gtggctattt taaatattaa aaatatgttc aagtggccag gtgcagtggc tcatgcctgt 153720

aatcccagca ctttgggagg ccaaggtggg taggagttca agaccagctt ggccaatatg 153780

gtgaaacccc ttctctacta aaaatacaaa aaaattagct gggcatggtg gcaggtgcct 153840

atagtcccag ctatatggga ggctgaggca caagaatcac ttgaacccgg gaggtggagg 153900

ttgaggttgc agtaagccga gattgtgcca cttgtactcc agcctggaca acagagtgag 153960

actctgtctc aaaaaaaaaa aaaaaaaagt taaagaaaac aagagtataa tgagaaaaat 154020

gcaaaatagt tttaaaagaa ccaaatggaa tttcttaaaa taaaaaatac cagaaatggg 154080

ggccgggcgt ggtagctcac gtctataatc ccagcacttt gtgggggctg aggcaggcag 154140

atcacctgag atcggtagtt caaggccagc ctgaccaaca tggagaaacc tcatctctac 154200

taaaaatata aaattagctg ggcgtggtgg cgcattgcct gtaatcccag ctacttggga 154260

ggctgaggca ggagaattgc ttgaacccgg gaggcagagg ttgcggtgag ctgagattgc 154320

accagtgcac tccagcttgg gccacaagag tgaaactccg tctcaaaaaa aaaacaaaaa 154380

aaaacagtag actcgaagaa ctagctgagt ttttctttac tttaggcagt aagtgtgacc 154440

ttttgcaggt gactacttta gttcctcatg tcctcattag tagatcagag aaattcgaca 154500

ccaaaacccc aaaagaaaaa ccccttctaa tcctcattcc atgattttat gaatgcatga 154560

agtcctaggc ctgcgaagga atactcattc tctttatcct gtgttgatac ctctctgctt 154620

caacctccaa ctcgacattt gcctatagga tgtacttgga cattcagcat aaactacctc 154680

acaccattac tgaattgctt catgtgcaca tgtcccatgc cacaataccg gggaccttgt 154740

cttccgtgat atttgtccgc agtgctgtga ctacaggagg gagtcagtga atgtctgcat 154800

gtgtgtcttt accatccctc ttgaatatgc tctagggtta attcctagaa gtagaattac 154860

tctattgaaa attggcaata tttttcattc taatatctat tgccaacatg ggaaagcaag 154920

tctggatgcc agtccttgtt atatgcccct tgggtaagtt acgtaacctc tttaagcttc 154980

tgttcactca tattttaaca aggaaaatta caatatttta cctcacaaaa ttgtagtcag 155040

cttctggctg tcttaaactc tggtatatag taaacactaa gtgttggtgt ccatccttaa 155100

tttgtaataa taggtcactt gttagagaaa tgcaccttac cattttcttt tcttttcttt 155160

tttcagttat gactcaaaac ttgagataaa ggaaatctgc ttgtgaaaaa taagagaact 155220

tttttccctt ggttggattc ttcaacacag ccaatgaaaa cagcactata tttctgatct 155280

gtcactgttg tttccaggag agaatgggag acaatcctag acttccacca taatgcagtt 155340

acctgtaggc ataattgatg cacatgatgt tcacacagtg agagtcttaa agatacaaaa 155400

tggtattgtt tacattacta gaaaattatt agttttccaa tggcaataac ccatttatga 155460

gagtgtttta gcctactgga atagacaggg accacatcct ctgggaagca gataagcata 155520

-continued

gaactgatac ttgatgcaca ctcgtagtgg taactcatcc ctaatcagca ttgtaaagca 155580

ggtgccagag gtggtttgct ttgtccttcc aaagcaggtg agtcagcccc accgagagcc 155640

aggcagcttt gagtggcagc gtggtgctag cagcttcagc ggaacagggt gagagttaat 155700

tatgcagtct tcttgacagc ggcattaatt tggaaggaaa ctgacaagtc atgggtcaag 155760

tttcagtgac ttcctccttc ctctgatggc agtatatagt tttcacattt taattcctcc 155820

tcctgagatg cactatactt aaaaccattc tctcccctgc taacagaagg gtgtgaatct 155880

ggtttacttt gagcattagg atttgccccc ttggaattct gcactccagt tacttaactt 155940

tcccttcaga atacatgtgg aaagaaagaa agaaatagcg atgactccac ttttgccccc 156000

gtggcacctt gaacaaagca gttcttccca aattatactt ttttttttt taaataaggt 156060

gagcaggatg actggggaga gagaaacatt tgactttgac tgcctccccc attctttgct 156120

gtgagctgga aagtgtgcag ttggtcgtct ttcttctcct ttctttagga tagtaagaga 156180

ctcactcact gcacttctgc tcagttggct tctgcatcgg gatcacacag ccatcagcag 156240

gactgcccag ttggtgagca cactccattg accacgtggc gccagcgctt cctcaatgca 156300

catgattgag aggaaagaaa gttctcttag atgttactgc ttttgctcag actttgcaaa 156360

aaaaaaaata tatatatata tgtataaata tataattatt aatcactttt gtccttgaga 156420

aagtcttgaa tgaacagaga atttattcca ttgcaatatt tgattgtata gaggcacact 156480

gtttcatcga cagaagaagc aaaaaggctt tgtgtaagtt tttggtacta tgtaccacct 156540

ctgttattct tttaaagctg aagtattcat gtacttaaac catattatat ttaattgtgt 156600

ttgattttaa aatatatata tatgaattct atttaaaatt gtgtcaactt tctgctttca 156660

gggcatttat ggctcttctg ttgaaatata ttgatctttc caaatatttt catttgcttt 156720

ctaaaaaccc agaacatgag ccactactgg actttgcctt gtgtttgaag tgtatggcat 156780

aaacccaagg tttttattag tcatctatgc tgtgattaat tcattttgtt cttttaacaa 156840

aatatttcca tccacttcac attgcttcaa tctttaacag aaaagcaata taaaggttat 156900

agaataaaat gtggttttgg gcaactcttg ctgcctctgc atgttttgga ataacaattt 156960

ctacaagact ctaggctgtt taaactagtg ctttcagtta agataaattc taatcatttc 157020

tttgtatata cattttgtgc ttctgagcta gagatgccaa gtagttgtaa actgcttata 157080

aagagaatag cagcaaattt gagactcggc tacttttttc tgccccacct gctttgagac 157140

acagaagcgg agtgtggccc gaaattatta gccagattta atatttgatc taaagtaggt 157200

ccttgtactc attttaaagt tggaatttga ttcctccaac attgagcacc caccatgttc 157260

caggctctgt gcattgtgcc cacaaaataa gattccctgg tggagttttt atgggttcaa 157320

ataatcagtt gaacaccctt catctttatc atgttgttga cattgacaca aattgtttaa 157380

aaagaaaaga tattagagag aaagtggtac ctttgtaact tgatgtgtct tcatcattcg 157440

gtaagatttg atgaaagtaa aaagcaaatg tcagccaaat ccagtgaaca gcaataaaac 157500

agggagtaac tttttataac tttttctact tggatttcaa cattcagtag agcttttcga 157560

aatgtaagta gtttacagta ctggaggttt gactagttca gtaggaattt ggaggggaag 157620

gtcattctga attgtaacaa agtacaaact tctttgctgt tttatttaag tactgagagc 157680

taagcacctg atgaagtgac tgacctctct ccagtgacag tgtttgggta cctgcctgac 157740

ttcaggagtg gggtttatgt ttctacacag tgacctttte tctcgccctc tcctccctct 157800

-continued

tgcccacaca ccagttgatt ggacctgggt tgaactcctg atccagacag gcccaagaca 157860

gttcttaatg ttaagaattt tggggccggg cacggtggct catgcctgta attgcaacac 157920

tttgggaggc cgagacaggc ggatcacttg aggtcagggg ttcgaggcca gcctggccaa 157980

catggtgaaa ccctgtcttt actaaaaata caaaaattag ctgggcatgg tggcgcacgc 158040

ctgtaatccc agctacgtgg gtggctgaga caggggaatc gcttgaacct ggaggcggag 158100

gttgtgcaat gagccgagac cgtgtcactg cattccagcc tgggtgacag agggagactc 158160

tgtctccaaa aataaaaata agaaaaagaa ttttgggcta ggtgcagtgg ctcacgcctg 158220

taattacagc attttggaag gcccaagatg ggcagatcac ttgaggacag gagttcgaga 158280

ccagcctgga caacatggtg aaactccatc tctactaaaa agacaaaagt tagccagatg 158340

tggtgatggg cacctataat cctagctcct cgggaggctg gggcaggaga atcacttgaa 158400

cccaggaagc agagattgca gtgagccaag atcacatctc tgcactccag cctgggcaac 158460

agagcaagac tctgtctcaa aaaaaaaaga atttggccag gcgcagtggt tcacgcctgt 158520

aatcccagca ctttgggagg ccaaggcagg cagatcacga ggtcaggaga tcgagattgt 158580

cctggctaac atggtgaaac cctgtctcta ctaaaaatac aaaacattag ccgggtgtgg 158640

tggtgggcac ctgtagtccc agctactagg gaggctgagg cagaggaagg atgtgaaccc 158700

aggaggcgga gcttgcagta agccaagatc gtgccactgc actacagtct gggcgacaga 158760

gtgagactcc gtctcaaaaa aaaaaagaat tttggccggg tgcggtggca catgcctgta 158820

gtcccagcac tttgggagac caaagtgggc ggattacctg aggtcaggag ttcaagacca 158880

gtccggccaa tatggcgaaa ccctgtctct tactaaaaaa aatacaaaaa ttagccaggt 158940

gtggtggcgg gcacctgggg aggctgaggc agggagaaat gcttgaaccg gggaggcaga 159000

ggttgcagta agccaagatc gtgccactgc actccagagc aagactcttt ctcaaaaaaa 159060

aaaaaaaaag aattttgcat ggggaaggag agatactgtt caccatctgg aatggtgctt 159120

ggatgtggca cttacaaaat caggagccag cactgcatgg acaaacagaa gcatgtgggc 159180

ctgagatagc aggtaccttg ataaccctga agacatcctt ggtttctgca tctattcctg 159240

catccttgca ttggactaca ttaatctgtc agttatcctt ataatgattt ttgatttttt 159300

ttttttgaga tggagtttcg ctcttgttgc ccaggctgga gtgcaatggc acgatctcgg 159360

ctcaccacaa cctccacctc ccaggttcaa gtgattctgc tgcctcagcc tcctgagtaa 159420

ctgggattac aggcatgcgc caccacacct ggctaatttt gtatttttag tagagacggg 159480

gtttctccat gttggtcagg ctggtctcga actcccaacc tcaggtgatc accctgtctc 159540

ggcctcccaa agtgctggga ttacaggcgt aagccatggt acccggtctg ttttttgatt 159600

ttttgaaacc agtctgaagt gagtttttt aattacgtga aaggagtttg gctaaaatac 159660

tgccatactg ccctaatgcc taatgattat gtattctcag catgtctgca aagtactgct 159720

gatttctgga gaataatttt tctttagtaa acttcactta agtcgtcatg tgtattctct 159780

caaaatggta tcctaaccta atggagctaa aagacacccc ttgtttttat aacaagcagt 159840

tactgaggcc caggaagggg agaagtccct ggcttgtgag atgatcacca ttagaactca 159900

ggcctgggcc agtgcctttt catgcttctc agatccttcc aaagaataat gaagattata 159960

accgctttta gcaattgtaa taaacccaga aatagaaagc tttttggtta gagtactggt 160020

agaagtttgg cgggagagat aatttttaca aaatttgtaa atacctgcca attctatata 160080

-continued

ctaggcaagg tctctggcct tgtaaaaccc ctcaaggtta caactttggt ggcccacact 160140

aatagttacc cactgaggcc ctctccgggt gaacattgag cactagagga agcccctctg 160200

cttgggcagg actgggcgtg gtgcagagta ggagcggtga tactgtggat tctgggcagg 160260

tggagatggc cagtgatgtc caataaagga cactggaggg agcagtgtga gtaaaggccc 160320

tgagggcatt catgttcagg gagggttgct gcccactggc ttgcttggca cacaggagag 160380

tgggtattcc tgccttagta actttatgta aacaagtatt tcctcagtct gttcctctca 160440

aactgcctgc tctggcacat tcagaatgtc acagaactca cctggatgca ttcagccccc 160500

tgcctaaagg tgacagtgca tctccttccc caccccaccc ctcataccac tgaagcacct 160560

gtcagactgg cccagtctgt gggcaaggag cctagagagg gcttagtttc agcttgaaag 160620

gagctgggat ttaccaagaa gcaaatgaga gacgaggatt gcaacaactg tgccatttcc 160680

ccagcttcag ctgactcctg tatattgact gtgccttcag actcatccgt aagtgacccc 160740

aggctggcct ctcccacatc acagtaagaa ttccacacac catacaactt ggaaagaggc 160800

tccagctgaa ggaagcccca cacttctttc aagtttttct tagtcttctc ttcttggcaa 160860

agagtacctt ttgtttcttc taattatgta actattggtt tagtaaatat tcacccattc 160920

agtcaccctg taagtggcag gcactgttta cagggacaca ggaaggaata aaaacttgca 160980

ggcaccttgg agcttgcatt ctattgaaga ggtaatggaa gttgggatag cagctaaact 161040

atgctggtat tggccaggcg cagtggctca cacctgtaat cccagcactt tggaggccaa 161100

ggtgggcaga tcatgaagtc aggagatcga gaccatcctg gctaacatgg tgaaaccccg 161160

tctctactaa aagtaaaaaa aaaaattagc caggtgtggt ggcgggcgcc tgtagtccca 161220

gctacttggg aggctgaggc aggagaatgg tgtgaaccca ggaggcgaag attgcagtga 161280

gccgagatgg caccactgca ctccagcctg ggtgacagag cgagactctg tctcagaaaa 161340

aaaaaatatg ctggtagttt tgattcaaga tggcctttgg agcccatgat ttaggtctcg 161400

tacccaccaa ggtctactgg aaaacatcag gctctcctgc tatagaccca tagggagagc 161460

tgcagccgag agggggagct gaagagaagt gccccttctg tgtcctgtca gcctcatcct 161520

tccgcaagga ccagttgctg tgccactcca ttcacttgct gcaagactgg aggtttttcc 161580

tcaggtgttg agcacctggt ttacaagatg tcagcatctt gatgcctgag accatcaagg 161640

caagtctctg aacagggctt accttagagt aaggcttaga agaggccgta aagtcagtct 161700

cagctccgtg gctctgcaga gctttgggac atgtgaattc ttaaaaacaa gactattgta 161760

cagttactat atgcatgcag tataaaatta taaccttgga aaatcctagc tagctgttga 161820

gctaattcca taaagtaatc agctcctgag ttctgcagtg gtaataataa tcagcataat 161880

gagtaaacac tgtgtgtgcc aggcagcgtc tcatttgatc cttgtgataa tcttgtaagt 161940

actgattttc tcccttcttt aaacaaagtt ttttttttt ttttagagag ggtctcacta 162000

tgttgcccag gctagtcttg aattc 162025

<210> SEQ ID NO 36
<211> LENGTH: 162025
<212> TYPE: DNA
<213> ORGANISM: Homo Sapien
<220> FEATURE:
<221> NAME/KEY: mutation
<222> LOCATION: 156,277
<223> OTHER INFORMATION: Nucleotide Base Change: T to C

-continued

<400> SEQUENCE: 36

gaattcctat ttcaaaagaa acaaatgggc caagtatggt ggctcatacc tgtaatccca 60

gcactttggg aggccgaggt gagtgggtca cttgaggtca ggagttccag gccagtctgg 120

ccaacatggt gaaacactgt ctctactaaa aatacaaaaa ttagccgggc gtggtggcgg 180

gcacctgtaa tcccagctac tcaggaggct gaggcaggag aattgcttga acctgggaga 240

tggaggttgc agtgagccga gatcgcgcca ctgctctcca gcctgggtgg cagagtgaga 300

ctctgtctca aaaagaaaca aagaaataaa tgaaacaatt ttgttcacat atatttcaca 360

aatttgaaat gttaaaggta ttatggtcac tgatatcctg tttcattctt tatataatca 420

ttaagtttga aatgtatact tgcactacta acacagtagt taatcttagt cctacaagtt 480

actgctttta cacaatatat tttcgtaata tgtatgcact ggtgtttatg tacgtgttta 540

tgtttatatc tgttaaaatt agcagtttcc atctttttct attttgtacc atcacatcag 600

ttcagaagga ttgacagagc aaaatgattt gatgaagtat aaaagtcaca tggtgagtgg 660

cataaataca actctgaaca attaggaggc tcactattga ctggaactaa actgcaagcc 720

agaaagacac atatcctata tgtcaagaga tgtaccaccc aggcagttaa agaagggaag 780

tacacataga aagcacaatg gtgaataatt aaaaaattgg aatttatcag acactggatt 840

catttgctcc taaagtcaga gtcctctatt gtttttttgt ttttgtgggt ttctttttaa 900

atttttttat tttttgtaga gtcggagtct cactgtgtta cccgggctgg tctagaactc 960

ctggcctcaa acaaacctcc tgcctcagct tcccaaagca ttgggattac agacatgagc 1020

cactgagccc agcccagacg ctttagcatt tatgaagctt ctgaaatagt tgtagaaacc 1080

gcataagctt tccatgtcac tttcaaagtt tgatggtctc tttagtaaac caaccaagtt 1140

attcctcaag ggcaaaataa catttctcag tgcaaaactg atgcacttca ttaccaaaag 1200

gaaaagacca caactataga ggcgtcattg aaagctgcac tcttcagagg ccaaaaaaaa 1260

aggtacaaac acatactaat ggaacattct ttagaagagc cccaaagtta atgataaaca 1320

ttttcatcaa agagaaaaga gaacaaggtg ttagcaaatt cctctatcaa ataacactaa 1380

acatcaagga acatcaatgg catgccatgt ggaagaggaa gtgctagctc atgtacaaac 1440

cagtagataa tttcaacttg ctgccgaatg aaacctcttt gcaaggtatg aatcagcact 1500

tctcatgttt gttttgcttt gttttgtttt gtttttagag acaggccctt gctctgtcac 1560

acaggctgga gtgcagtggc acgatcagag ctcactgcaa cctgaaactc ctgggctcaa 1620

gggatcctcc tgccttagcc tcccaagtag ctgggactac aggcccacca tgcccagcta 1680

atttttaaa ttttctatag agatgggatc tcactagcac ctttcatgtt tgatgttcat 1740

atacaacgac caaggtacaa tgtggaaaag ggtctcaggg atctaaagtg aaggaggacc 1800

agaaagaaaa ggggttgcta catagagtag aagaagttgc acttcatgcc agtctacaac 1860

actgctgttt tcctcagagc agagttgatg atctaaatca ggggtcccca acccccagtt 1920

catagcctgt taggaaccgg gccacacagc aggaggtgag caataggcaa gcgagcatta 1980

ccacctgggc ttcacctccc gtcagatcag tgatgtcatt agattctcat aggaccatga 2040

accctattgt gaactgagca tgcaagggat gtaggttttc cgctctttat gagactctaa 2100

tgccggaaga tctgtcactg tcttccatca ccctgagatg ggaacatcta gttgcaggaa 2160

aacaacctca gggctcccat tgattctata ttacagtgag ttgtatcatt atttcattct 2220

-continued

atattacaat gtaataataa tagaaataaa ggcacaatag gccaggcgtg gtggctcaca 2280

cctgtaatcc cagcacttcg ggaggccaag gcaggcggat cacgaggtca ggagatcgag 2340

accatcctgg ctaaaacggt gaaaccccgt ctactaaaaa ttcaaaaaaa aattagccgg 2400

gtgtggtggt gggcacctgt agtcccagct actcgagagg ctgaggcagg agaatggtgt 2460

gaacctggga ggcagagctt gaggtaagcc gagatcacgc cactgcactc cagcctgggc 2520

gacagagcga tactctgtct caaaaaaaaa aaaaaaaaaa aaagaaataa agtgaacaat 2580

aaatgtaatg tggctgaatc attccaaaac aatcccccca ccccagttca cggaaaaatt 2640

ctcccacaaa accagtccct ggtgccaaaa aggttgggga ccgctaatct aaataatcta 2700

atcttcattc aatgctaaaa aatgaataaa ctttttttta aatacacggt ctcactttgt 2760

tgcccaggct ggagtacggt ggcatgatca cagctcactg tagcctcaat cacccaggcc 2820

ccagcgatcc tcccacctaa acttcctgag tagctgggac tacaggcacg caccaccatg 2880

cccagctaat ttttaaattt tttatagaga tggggggtct accatgttgc ccagactggt 2940

ctcaaaccct gggctcaagt gatcctccct caaactcctg gactcaagtg atcctccttc 3000

cttggcctcc caaagtgctg ggattacaag catgagccac tgtacccagc tggataaaca 3060

ttttaagtcg cactacagtc atggacaatc aggcttttca acatgcagta tggacagtga 3120

gtcccagggt ctgcttttcc atactgaaat acatgtgata ctaaggagaa aggtgctcgc 3180

aaggatattt aaaatgaaga atatttaaaa tgaggaaaaa actgtttctt catgactttg 3240

ataaggctga taaagaccat ttctgtgatc tcaggtgatt cactcaagta gtatatttca 3300

gtaatcatta tctggaacag cctgaatctt aaccaaaata ccatgatttt ttaatgctgt 3360

tatgatacct tgatgatatg accaaactgc aatgtaggca gctaaatctc cacgagtttg 3420

acttccccga gagttgacag ttttcttcac aaattaaaga aatatatttt ttgatacatg 3480

attggcatat ttaaaaacta cactgaaatg ctgcaaaatg atataaagaa acattttcca 3540

gaatcaaatg caatcaaaga gtggattagg aatctactca ccattatcaa ctaaatagaa 3600

acacttggac tgggtgtggt ggctcacatc tgtaatctca gcactttggg aggccaaggc 3660

aggtggattg cttgaggcca ggagctcaag accagcctga gcaacatagc aaaactctgt 3720

ctctacaaaa aaaaaaaaaa attaaccagg catggtggca gatgcttgta atcccagcta 3780

ctctggaagc tgaagtagga ggactgcttg agcccaggag atcaagactg cagtgagccg 3840

tggtcatgct gcgccacagc ctgagtgaca gagagagacc ctgtctcaaa aacaaaaaca 3900

aacaaaaaac acttaacctt cctgtttttt gctgttgttg ttgttgtttg tttgttttga 3960

gatggagtct cactctgttg cccaggctgg agtgcagtgg cgtgatcttg gctcactgca 4020

agctctgcct cccgggttca cgccattctc ctgcctcagc ctcccgagta gctgggacta 4080

taggcgcccg ccaccacgcc cggctacttt tttgcatttt tagtagagat ggggtttcac 4140

cgtgttagcc aggatggtct tgatctcctg acctcgtgat ccacctgcct cggcctccca 4200

aagtgctggg attacaggca tgagccaccg cacccggcca acctttctgt tttttagttt 4260

gatatgcttg ttaactcagc agctgaaaga atgctgaaag tggccttcag taaaaaaatt 4320

tcactagaat ctctacatcc atatttaatc tgaatgcata tccagattga tcagttagag 4380

caaaaacact catcatcatt cctgatgacc tctaattctg gtttcggctt tctatttcaa 4440

tggaaacaga ataaggaaag aaatggaagg gctctggaaa tttgtcctgg gctatagata 4500

-continued

ctatcaaaga tcaccaacaa taagatctct cctataaata taaaacaagt ataattaatt 4560

ttttaattat ttttttctct tcagaggatt ttatttcaag ataaaacata acttctaccc 4620

atactattga ttccaaaggt tagaaaaagt gtttttcctc atcttatcct tcaaagaggt 4680

cacagcaatg caaacatcta taaaatgcct ctgcataatt gtcagaagct atagtccaga 4740

aatcattgaa aatgctttc catttaagc ttaggtgagg tgtcttagga aacctctatg 4800

acaacttact ctatttattg ggaggtaaac tcccagactc tcccagggtc tcctgtattg 4860

atctcatttt ttaggcttcc taatcccttg aagcacaatc gaaaaagccc tggatctctt 4920

ttctgcacat atcatcgcgg aattcattcg gcttccagca agctgacact ccatgataca 4980

agcggcctcg cccttctccg gacgccagtc cttgctgcgg ttagctagga tgaggggttt 5040

gctgggcttc agtgcaggct tctgcgggtt cccaagccgc accaggtggc ctcacaggct 5100

ggatgtcacc attgcacact gagctcctgg caggctgtac caatttttta attatttaat 5160

atttatttt aaaattatgg tgaatatttt ggtattctgc tctaaaatag gcccataaat 5220

gcacagcaga tatctcttgg aacccacagc tttccactgg aagaactaag tatttttctt 5280

ttaaagatgc tactaagtct ctgaaaagtc cagatcctct acctctttcc atcccaaact 5340

aagacttgga atttatgaga gatctagcta acagaaatcc cagacacatc attggttctt 5400

cccagagtgc agtcctccta aagaggctca gccctaagca ggcccctgca ccaggagggt 5460

gggtctgaga cccacatagc acttcccaag gtgcatgctc cagagaggca ctgaaacagc 5520

tgagcacaag cctgcaagcc tggagaactc tcacagtcag aacggagggg gcccagtggg 5580

actaacataa agagaaaagg gaacacagag aaatggatgg caccaacaac cagcaaagcc 5640

ttcatggcca atgaaagcat cagtgacggg gccagaaccc tcatccccaa agactcttca 5700

ctgcctttag tgaaaaacaa tggctagaga gtgaagttat gatcatgtat agagaggtaa 5760

agttacattt ttatattctg actctgctaa tgtgaaattc cctatctgct agactaaaag 5820

tttcagacac cctgttcaaa tatcccatta gttgctagag acttaaaatg aacagaacgc 5880

acattgtcag gatgactatt accaaaaaat caaaagacag caagtattgg tgaggatgta 5940

gagaaactgg aacttttgtg cactgtttat gagaatgtaa aatggagcag ctgctgtgga 6000

aaagagtatg caggttcctc aaagagtaaa accaagatgt ggaaacaact aaatgcccat 6060

cagtggatga aggggtagac aatatgtggt atatacatac catggagtac tattcagcct 6120

ctaaaaaaaa aaaaggaaat tctataacat gcaacagcat ggatgaatct tgaggacatt 6180

ttgctaatga aataaggcag tcatagaaag acaaatactg cacgactcca cttatatgag 6240

ataccaaaaa tagacaaatt catagaatca aagagtacaa tggaggttac ctggagctgc 6300

agggcgggaa acgaggagtt actaatcaac gaacataacg ttgcagttaa gtaagatgaa 6360

taagctctca agatcagctg tacaacactg tacctagagt caacaataat gtattgtaca 6420

cttaaaaatt tgttaagggt agattaacaa atgtagtaga tccacaaatg tggttaagtg 6480

ttcttaccac agtaaaataa aaaaagaata tcaagcccag gagttcgaga ctagcctggg 6540

taacatggtg aaaccctgtc tctacagaaa atacaaaaat tagccagctg tggaggtgca 6600

ctcctaggga ggctgaggtg ggaggcttgc ttgagcccag gaggtcaagg ctgcagtgag 6660

ccatgattgc accactgtac tccagcccag atgacagagc aagacaccac ccccccaaaa 6720

aaaagaaaaa gaatatcaaa cattttaaaa gatcagatac gcaagaacaa caacaaaaaa 6780

-continued

gagatgaaca gagcatcgac cctcatctag tgggattctt ggtctaactg aaaaacagac 6840

attgagagac aaacaatgac agtgatgtga tcacagcaat tacacaggta tcccctgggg 6900

actgcagaag aaaggaggaa tgcctaactt tcagaaaata gagaaagcgt caaacagttg 6960

gtgaaagcct tccaaaacta gagagaactg cacacaccaa atcacagaaa gaagaaaagc 7020

cgtgggagat tctgggaccc accggctatt tttgatggct gaacaccctg ctgcaggaga 7080

gacaggagct ggaaagcatg gtgggatgaa acctcaaaca gctttgcctg cattgcttaa 7140

gatgactggg cttgattaac tctagtcaat ggggacaatt caatcaaaga agaaagatgc 7200

tcaaattcac attttagaat gatttttat ggcagtatgg ggaatagatt aaaagagagt 7260

gaagctggag gcaagaaact tgttaagagg caactgaaac agtctagatg ataaataata 7320

aactgacaga gtgactagaa aaatcagaac aggctgaatc aacagatacc tagatgaaaa 7380

taacaggact tgatcaccag ttgtatcttg gagaggaagg agttgtttcc ttgctttccc 7440

tacgactggg aatacggaag gtttgccgtg tgtattggtt atatactggt gtgtagccaa 7500

tcactgacaa ccatttagca gcttaaaaca caaaggctta tctcccagtt tctgtgggcc 7560

aggaatctaa gataggctta gctggctggt tctggctcag agtttctcaa gaggttgcaa 7620

tcaagatgtc agctggggtt gcatcatctg aaggctcaac tggggccgga gggtccactt 7680

ccaaggagtt cactcacctg cctgacaagg cagtgctggt tgttggcagg agatctcaat 7740

tcattgccaa gtgagcctct ctatagcatt gctggaacat cctccccatc tggcagttgg 7800

cttctctcag catgagtgat ctgagagaga gagcaaggag gaagccacag tgttcttcct 7860

actcctactc ctaacactat ggacctactc ctaacactct cacttctgcc ttattccatt 7920

agttagaaag ggaactaagc tccacctctt gaaataagaa gtgtcaaaga atttgtggat 7980

atatttaaaa atcatcacac tgtggaagtg gatagggggt tcaattaatg ctgaacttga 8040

aatgcctgag acattcaaat gtccaacagg caatgaacat acccatagat ggtcatgact 8100

ttagcaagaa tagaggaaga tcacagaatt aaggaggaat tgaaaggtaa aagaagtgga 8160

gtcagattcc ccctgaaaag tgagccatga aaggaacttt aactattgag ttagaggtca 8220

gagtaggaaa tttcggtgga attctttttt aaagaaagga accatataag catgttttga 8280

ggtagaggga gaataaatca gtagacaggg agaggtaaaa aacataaatg ataggggata 8340

gttgacaaag gtcttggcag aatcccttac ccattgactt ggggccaaga gagggacact 8400

tctttgtttg agggataagg aaaataagaa agaatgggtg ctatttagtg tggtcctgtc 8460

tctagggcaa acgcataggt aacaaactgt gtgtgttagg aatatagatg tgacctcaca 8520

ttgagattct cacctcaaat ccattttgtt gttacctgta ccttcctacc ttctcttttt 8580

gctacatgca gactgctgtt ttgtcttcct ggcctgttcc aggtttcagc attctggcat 8640

atctgctacc ctgttcccaa acctctctag agtccatgct ccttccttgg atagtgtttg 8700

attgggccac gtatctaaga agtgatgcct tcagttaggc ctgagaacct cctctatgga 8760

aatctccatc agtgaccctg acagacttgg tatcttggag atgtcactgc tcccagcctg 8820

tggtctagga gaatctcagc ctgggcctct agtagtatgg ataaggcgtt aaggtatctt 8880

tgaaccagag tctgtcatat tcctcaatgt gggacagata aaacagtggt agtgctggtg 8940

tttctgagct agaactctgg tttttggtct agattctttg atgtatgacc tttcagaggt 9000

attaaaattt gttctaatac aatgttcaat acaaatgtag ttcctttttct gttaggacct 9060

-continued

caacaaaaca tgaccaactg tagatgaaca ttaaactatg acaattcatg gaaatgaata 9120

cagtaatacc tgcggttccc ccattttagc agtcactatg gtgacatttg gcacaaatgg 9180

ctatttaagg gtgcttttgt taaaacctac catcttacta ggcacatgat attgaaacta 9240

atgaaataat ggagaaactt cttaaaaact tttaatgaat aaagtgatga agtgataata 9300

ttttagctgc tatttataaa gtgactatta caggtcaaac attcttctag ggtttttttg 9360

ttgaagttgt cacatttaat ccttaataac ccactatgag tcaggtattc ttctctcccc 9420

tttggacagt tggggaaatg ggggtcagag aggttaggta atttgctcag ggccacacaa 9480

cctgcatgta gaaaatctga gatttgtaca ggaacgtatc aaactctgaa gtccatgctt 9540

ctattttccc atgctgcctt tctaataaaa ggtaactaat gctactggat gctgccccca 9600

aagtgagtca ctttcacccc accctacttg attttctcca taaaactaat cacatcctga 9660

caacttattt attgctgatc tcccccacta gattataaac tcaataaaag caagatcctt 9720

gtctgctgaa tatcagtacc taaaacgctg tctagcacag agcaagtaat taatatttgt 9780

tgaatgaaca aataaaggaa aaaaattcaa aggaagaaaa agccctaaaa cagatgttta 9840

cctaaacata cattttaaaa gaaagcatat aacaaattca ggacagaatt taaatttgat 9900

tttttaaaga aataaccaag tgctagctgg gcacagtggc tcacacctgt aatcctagca 9960

ctctgggagg ccgaggcagg cagatcactt gaggtcaaga gttcaagacc agcctggcca 10020

acatggtgaa acctgtctct actaaaaata cagaaattat ccaggcatgg tggcaggtcc 10080

ctgtaacccc agctactcag gaggctgagt caggagaatt gcttgaaccc aggaggcaga 10140

ggttgcagtg ggccaagatt gcaccactgc actccagcct gagtaacaaa gcaagactct 10200

gtctgaagga gaaggaaaga aagaaggaaa gaaggaaaga aggaaagaag gaaagaagga 10260

aagaaagaaa gaaagaaaga aagaaagaaa gaaagaaaga aagaaagaaa gaaagaaaga 10320

aagaaagaaa aagaaagaaa gaaagaaaga accaagtgct tatttgggac ctactatgct 10380

atgtttttcc atgcacgcta ttttcagtaa agcagttagc aaacttgcaa gatcataaca 10440

acaaatatat gcttctataa ctctaaaatt gtgctttaag aagttcctct ttaccagctc 10500

atgtatgcat tagttttcta agagttacta gtaacttttt ccctggagaa tatccacagc 10560

cagtttattt aaccaaagga ggatgcttac taacatgaag ttatcaaatg tgagcctaag 10620

ttgggccagt tcatgttaat atactccaga acaaaaacca tcctactgtc ctctgacaat 10680

tttacctgaa aattcatttt ccacattacc aaggagccag ggtaggagaa tatagaaaga 10740

ccacccaaga atccttactt ctttcagcaa aatcaattca aagtaggtaa ctaaacacat 10800

gccctaacaa tgaatagcag attgtgctca gaagaatgat ctacaacatc ttactgtgaa 10860

ggaactactg aaatattcca ataagacttc tctccaaaat gattttattg aatttgcatt 10920

ttaaaaaata ttttaagcct aaattttaaa aggtttgata ttggtacatg aatagacaaa 10980

cagacatgga ctagaccaag aattaggttc aaacatatac aggaatttaa tatacgataa 11040

atctagtatt ccaaaggaac caacaaatgg tgttcagaca gcaggatagg catcaggaaa 11100

aacacagttg ggcaccctac cttactccta acaccaggag taactgaagg agcaccaaat 11160

atttatttat tttaattata gttttaagtt ctagggtacg tgtgcacaac atgcaggttt 11220

attacatagg tatacatgtg ccatgttggt gaggagcacc aaatatttaa aagaaaaaaa 11280

ttggccaggg gcggtggctc acacctgtaa tcccagcact ttgggaggcc aaggtgggca 11340

-continued

gatcacctga ggtcgggagt tcgagaccag cctgagcaac atggagaaac cccatctcta 11400

ctaaaaatac aaaattagcc aggcatggtg gcacatgcct gtaatcccag ctacttggga 11460

ggctgaggca ggagaatagc tttaatctgg gaggcacagg ttgcggtgag ctgagatatt 11520

gcactccagc ctgggcaaca agagcaaaac ttcaactcaa aaaaattaat aaataaataa 11580

aaataaagaa agaaaagaaa aaaatgaaaa tagtataatt agcagaagaa aacaccgtag 11640

aatcctcgga ctcttaggat ggggaatgcc tataatataa aaaccctgaa gttataaaag 11700

agaaaatcac ctacatacaa accaaatctt tctacatgcc taaaacatag cacaaacaca 11760

gctaaataat catagctgaa tgaactggga aaacaaaact tgactcatat ccagacagag 11820

ttaattttcc tacacataaa gagtacctat ataaacccaa caaaaaaacc accactaacc 11880

caaaataaaa atgtgacagg taatgaacag gtagttcaca gagaatacaa atggctcttc 11940

ggcacataag atgctcagac tgacttttac ttatttattt tttgagagac agggtctcac 12000

gatgttgccc aggttaggct caaactcctg ggctcaaatg atagtaccag gactacaggt 12060

gtgccccacc gcacctggct cctcaaccac ctgtattaac aggaaatgca aaataaaact 12120

ttcaaatcta ttttacctat tagaatggca aaaatttgaa aaacttcaaa catcatcatg 12180

ttggtgagaa tgtgaggaga ctggcactct catttttgc tgatagcata tatatactga 12240

tggcttctat ggaaagcaat ctggcagcgt ctatcaaatg tacaagtgca tatatccttt 12300

gacaaagcaa ttccactcta ggaatgtgtt ctatatggtt gtgcttcctg gggctgggaa 12360

ctgggagcta agggacaggg gcagaagata atcttctttt ccctccttcc ccgttaaaca 12420

tgttgaattt tatatactgt aatatattat ttttcacaaa agataatttt taagcgatat 12480

gtctgggaat ttttttttt cttttctgag acagggtctc actctgtcat ccaggctgga 12540

atgccatggt atgatctcag ctgactgcag cctcgacctc ctgggttcaa gcaatcctcc 12600

cacctcagcc tcctgagtag ctgggactac aggcacgtgc catcatgcta atttttgtat 12660

atacagggtc tcactatgtt gcccaggcta atgtcaaact cctaggctca agcaatccac 12720

ccacctcagg ctccaaagtg ctgggattac aggcgtgagc caccgcgcct ggccctggga 12780

attcttacaa aagaaaaaat atctactctc cccttctatt aaagtcaaaa cagagaagga 12840

aattcaacct ataatgaaag tagagaaggg cctcaaccct gagcaacaaa cacaaaggct 12900

atttctgaga caggaatttg ctgaacaaaa tcgagggaag atgacaagaa tcaagactca 12960

cttctcggct gggcgcagtg gctcacacct gtaatcccag cactttggga ggccgaggcg 13020

gacagatcac gaggtcagga gattgagacc atactggcta acacagtgaa acccagtctc 13080

tactaaaaat acaaaaaatt agccgggcgt ggtggcaggt gcctgtagtc ccagctactt 13140

gggaagctga ggcaggagaa tggcgtgaac ccaggaagcg gagcttgcag tgagccgaga 13200

tcacgccact gcactccagc ctgggtgaca gagcaagact ctgtctcaaa aaaaaaaaaa 13260

aagactcatt tctctagatc ttgagccgta ttcaaattta tctcagctta gtgagaggtt 13320

aaagcaagga atatccttcc ctgtgggccc tgctccttac tgaaggaagg taacggatga 13380

gtcaaggaca ccaatggaga aaagcactaa caccattatc tgatgaacat tacgtgaaga 13440

agggtaagaa gtgaagtgga attgctgaag aagtcagtga aagcggacat tcatttgggg 13500

aaatggaata taggaaatcc ataaaagtga ttaaaaagat gttagaggct gaggcggggg 13560

gaccacaggg tcaggagatc gagaccatcc tggctaacac ggtgaaaccc catctctact 13620

-continued

aaaaatacaa aaaattagcc aggcgtggtg gcaggcacct gtagtcccaa ctactcggga 13680

gactgaggca ggagaatggc atgaacctgg gagacggagc ttgcagtgag ccgagatcac 13740

gccactgcac tccagcctgg gtgacagagt gagactccat ctcaaaaaaa aaagttagat 13800

acgagagata aagatccaac agacacacaa ctgctaattc tgaacagaac aaaacaaatg 13860

gcacaggaaa agaaaattta agatataaca ccggaaaact ttcctgaaat tgagtaactg 13920

aatctatagc ttgaaagggt ttagcatatg ccaagaaaaa tcagtagagt ccaaccagca 13980

caagacacat ctagcaaggc tggtgattct accaacacag agaaagaagt gggtgaccca 14040

taatgcggaa aaaggcagac catctgcagt cttctccaga acactggagt ctgaagacaa 14100

aagaatgctg cctactgagc cagaagggag agaaagtgac ccaacacatc tttaccaagt 14160

tagaatgtca cgcattattt aaaggctgca aaagccatga aagacatgaa agaacacaag 14220

catttacaac atgaaagaac acaagcattc tcatactcaa gaatccttaa gaaaaatgta 14280

gtcctaatcc agcccactga aagttaaatg tacttaatgt gctcattaat gggaacttca 14340

tagcttcaaa tcagtctggt cccatctacc aacatctctc gcccggcttt cctgcaatag 14400

tcagcacctt tccctcctcc cagtcttgtc ccctggagtc tgctctcagc atagcagagt 14460

gaccacatca acacccaagt cagagccctc cagtgcgcac tggtctacaa agcccttccc 14520

acccccacc ccacgtgccc tccggatcct tgtgacgtgt ctcctgcata ccctagcagc 14580

cctggcctcc tcactgcccc tcctgtacat caggaaggcg actccttgag tcttggctct 14640

ggccgcctcc tccacctgca gtgagttaac tcccttacct actctaggtc attgctcaaa 14700

tgtcagcatc tcaatggggc cctccctgac taccctattt aaattctaca tactcccctt 14760

gaccccatgg acctcactca ccctattcca cttttattct tacaatttag cacttgttct 14820

cttctaacgt attctaagac ttactcattt attacattgt ttgccacccc ctctagtaca 14880

taaactccag aggggcaggg atttctgtct atttattcat ttctttatcc ctaggacata 14940

gaacagggca tagttcagag tattcaatgt tatcaatgaa tgaactagca gtagtaccag 15000

ttccagttag gcacagaatt aaatctaaat agaattaaat ctcatggtct gggttaacta 15060

tggatagaaa attagatata attttaagaa gcctagaaag aaaaaattaa taatgtaaaa 15120

ataatattaa tttgataata ataacaaaaa ctctgccagg cactgtggct caaatctgca 15180

atcccagcta ctcaggaggc tgaggtggaa ggatcacttg agaccagagt tcaagactca 15240

gcctaggcaa cacggcaaga aactgtctct aaaaaaatta aaacttaaat ttttaaaaaa 15300

gaattctcaa agcgtcacaa aaactggaga ttaaggtaca ggaagtgtga agtaatatta 15360

ctatgctaat ggtttttttt ttttttagaa aggtataacc aaaagatttc tttctcaagt 15420

cgataaactg agaaagataa gcatatcttc caattaacag agggggagga aaagccagat 15480

acaacaaaat aagatataaa ttagtttcca gttgaaaaca agagtaggag ttattttgca 15540

tcacctcacc tgtgacctcc cccagcccaa aaaacactac tgataaacag ggtagaaaag 15600

catcatctca gataaagcag gaaaaactgc cacagtctca aaccacaaac tataagcaca 15660

cacctggcca accctgccaa gtctgggctc agtaggagga acgtgctgag agctaggatg 15720

taccaactta gacattctgt gggatacaga tgtccctgga agggtcacac catctcaaag 15780

gcacctgtaa tgcccactga ttacagccac catatgtgag agagaaactc agggcactta 15840

gagagtataa caagaacctt atgtcatctg agatgaggaa tcctcagccc tgcaaattaa 15900

-continued

ccaactcttt agaacaactg gcaaaacata aatatccaca acttttgttt cagtaattcc 15960

actcttagat atcaatccaa agtacatgag acagcagata cacacacaaa atggtattta 16020

ctgcagcatt gtttataata gcaaaaaaca agaaataatc catatgtctc aataggatac 16080

tgggtacatg agggtatgta cccatcattc aaccatcaaa aagagtgata tggatgtcca 16140

cagatggaca taaaaagctg tgtgttacgt gaaaacaaac tcaagcagca gcaggatggg 16200

cttatgatag tcagtatgag ctaatttctg gaaaaaaaaa tctagtgtgt gcacagaaaa 16260

catctgaaag aacagaaaca aaactatcag cagaatattg agatgtttta ctaagttgta 16320

tatctatact gcttgtaatt tttaccccaa gcaagaatta ctttttggaa aaagaaaatt 16380

caggaaataa agcatttctt taaacttcat gtttaaacaa atggtgatgg aataaaagag 16440

ttcttattca tcataaacac acacagcaca catgcacgca tgtgcgtgag cacacccttt 16500

acttgataaa taccatgttg aatattttag tctttccttt taggttctat cccttcactc 16560

aaaatgcggt tataaataaa tgtacttttc atgtgccttc tgcctaaacc cactttaata 16620

taactttaca gtcccattat cattatagtc tcaaagctag actcagcctg aaactaccct 16680

ttcatttgga acccttatta aaatgccaca tacagctcct tcaaataaaa acaaacccta 16740

ggacctgaca ctaggcttcc tttgttgcta ctcataatgg ccaagttctg tgcttataat 16800

acatcttctt tcattttatt gctacatatc caagggtttt atatgttttt cttattatat 16860

cttaattcaa aacaccatca cgctcttttc cagatgaaaa taaggaaaag aaattgagca 16920

actgactgac ttaaaggtca taaaactata tagtagcaga gtcagcaaaa gaagaaacac 16980

acatctccca agtagaggct gaaaaccagt accattcacc tccagggtga gctatataca 17040

gattacaaag tcaccttctc taaatgttca aactgaatcc catacccata ctttaccact 17100

acctcgtaag aacagcctca gatcttgtta tagccttttt tttagcatgc tgaagccaat 17160

aaaatgcttc ccattcagca agagaaacaa gttctgaaac actgaataat ctgcccaggg 17220

cctatgaaca tttccactgt gagaaatgtt ctccactgtg tggagaagat ccttactctt 17280

ctccacacag gcagaacatt agaaaaattc ttggattcta tgatgcacag cttaggagtc 17340

tgtttagcac aatttaagtc caaatagtta ttaaatcctc ctctgttcca gaaacagtgc 17400

taaatactgt gaatataaaa attgaaaaga tactctcctg gctcccaaga aagtcagcca 17460

gatagaggag acacaggcac acaaatcact gtcacatgaa gctctacctc cctaacttca 17520

aacgagggcc taagtcacca agaatacagt agcagttgtg actacgagta actactataa 17580

ttcaatactt tatcttccct tagaaaactc ttctcccttg gaaatttatt tgcatttcta 17640

aataccattc cttactaaaa ggaagcaggg ctccttgggg aaatagctga ttctaggtgt 17700

ggactatgaa atgaaaatgg tgagtctggg acatcccatg ttgcccagaa atcaaggaac 17760

tgcccaaaga ttaacagagt catgttaaat ggacctaaga gtgaaccaga aggagctcac 17820

tttgccccgc gtggaacaat ttcaagaaaa acatgacagt aatgaattat aaaacatgaa 17880

ttaaaataca tattggtact aaaaagagaa caaaaggatg tggctttgga taaagctctt 17940

cttcatggaa gaataccagc taataaatgt aaaggaaatg agagaattag aaaaattatc 18000

attttgtaaa ccttaatata ttcacctaga catgctaaaa ccactgagta aaaggctgct 18060

tgggaagagg atgctcacat gatctcagag tttcacacca cagataattt attagataca 18120

ggaaggaaga tgtgatcaag cttcctgtga cccccagcca ggccccacaa cactatgtgc 18180

-continued

ctccttgtga tgtgggagct acacagcatc gcccacacag cttctcgcca aaactgtttg 18240

aagctaatca caagggaaga actggacagc ttctgaccat gagacgctcc accagacaac 18300

ttgcttggcc tctccaaaga aacttgcttg gcctctccaa agaaaactca gtttcattta 18360

aaaacaaaac taattattta aaaacaaacg aaaagcaagt tgtggacttg agctccaggg 18420

acagagcaga catactttc cctgttcttc ccagtaagtg gtaataaaaa ccctcaacac 18480

tagatataaa acaaatataa gaaggttctg gaaggggaag aggaggcaga ctatccaggt 18540

gccttgaggc ccacagaaca acccagtgat gggttcactg ggtcttcttt ttgcttcatt 18600

atctcagact tggagctgaa gcagcaggca acttcaaaac accaaggggc acagattgaa 18660

aagccccaag aaaagcctgc cctctctagc caaaggacca ggaaggagac agtctaatga 18720

gatggaacac atttagacag taactgccca tttaccagca ataactgagc agggagccta 18780

gacttccagt cttgtgagga cgtaccaagg tacccaacac ccccaccaag gctgagtaag 18840

gactgcgact tttatccctg catggcagta gtaaggagcc catccctcac ccgccagcag 18900

tgtcagggga acctggactt ccactcccac ccaggagtga tgaggccctc cctgctgggg 18960

tcatgtcaga ggaggcctag tggagattca gtgacttaac cttttcccag agataatgag 19020

gccacctttc ctcccctcttc ccccatggtg acagtgaaag cactgtggca agcagtaggc 19080

actcctaccc ctcctagcca gggaggtatc agggaggcca agtagggaac cagaataccc 19140

acaaccaccc agcagcaaca ggggtccccc accccattgg gtgtcaatgg aagcagagcg 19200

gaaagcctgg atatttaccc ccatctagaa gtaacaagct gatgtccccc ttcttctact 19260

acaatggtgt tcaaaacagg tttaaataag gtctagagtc tgataacgta atacccaaat 19320

cgttgaagtt ttcattgagg atcatttata ccaagagtca ggaagatccc aaactgaaag 19380

agagaaaaga caattgacag acactagcac taagagagca cagatattag aactacctga 19440

aaggatgtta aagcacatat cataagcctc aacaggctgg gcgcggtggc tcacgcctgt 19500

aaccccagca ctttgggagg ccgaggcagg tggatcacaa gatcaggaga tcgagaccat 19560

cctggctaac acggtgaaac cccgtctcta ctaaaaatac aaaaaaaaat agcaaggcat 19620

ggtggtgggc acctgtagtc ccagctactc gggagcctga ggcaggagaa tggcatgaac 19680

ctgggaagag gagcagtgag ccgagatcgc accaccgcac tccagcctgg gcaacagagc 19740

aagacttcgt cccaaaaaaa aaaaaaaaaa aaaaaaaagc ctcaacaaac aactacaaac 19800

gtgcttgaaa caaatgaaaa aaaaatcttg gcaaagaaat aaaagatata tattttggcc 19860

aggtgcagtg gctcacagcc tgtaatccct gcactttggg aggctgaggc aggcggatca 19920

cctgaggtca ggagtttgag accagcctga ccaacatgga gaaaccccgt ctctactaaa 19980

aatacaaaat tagccagtca tggtggcaca tgcctgtaat cctagctact caggaggccg 20040

aggcaggaga atcgcttgaa ctcaggaggt ggaggttgcg gtgagccgag atcccgccat 20100

tgcacattgc actccagcct gggcaacaag agcaaaactc catctcaaaa aaatagatac 20160

atattttaat ggaaatttta gaattgaaaa atacagtaac caaattgaat ggaaagacaa 20220

catagaatgg agggggcaga caaaataatc agtgaacttc aacagaaaat aatagaaatt 20280

acccaatatg aagaacagaa agaaaataga ctggccaaaa aataaagaag aaaaaagagg 20340

agcagcagga ggaatgatgg aaaaagagaa aggaaggaag gaagggaagg agggagggaa 20400

ggagtgaggg agaaagtctc aaagacctct gagactaaaa taaaagatct aacacttgtc 20460

-continued

atcagggtcc aggaaagaga caaagatggc acagctggaa acgtattcaa aaaataatag 20520

ctgaaaactt cccaaatttg gcaagagaca taaacctata gattcgaaat gctgaacccc 20580

aaataaaaag cccaataaaa tccacaccaa aatacatcat agtcaaactt ctgaaaagac 20640

gaaaagagaa aacgtcttga aagcagtgag tgaaacaaca cttcatgtat aagggaaaaa 20700

caattcaagt aacagatttc ttacagaaat taaggaagcc agaaggaaat gacacaatgg 20760

ttttcaagtg ctgaaagaaa agaagtgtca acacaaaatt ctagattcag taaaaatatc 20820

cttcaagaat caatgggaaa tcaagacagt ctcagataaa gcaaaataag agaatatgtt 20880

gccagcagat ctcccctaaa ggaatggcaa aaggaagatc atgcaacaga ccaaaaaatg 20940

atgaaagaag gaatccagaa acatcaagaa gaaagaaata acatagtaag caaaaataca 21000

tgtaattaca ataaaatttc tatctcctct taagacttct aaattatatt gatggttgaa 21060

gcaaaaatta taaccctgtc tgaagtgctt ctactaaatg tatgcagaga attataaatg 21120

gggaaagtat aggtttctat acctcattga agtggtaaaa tgacaacact gtgaaaagtt 21180

acatacacac acacacgtaa gtatatataa atatatgtgt gtatatgtgt gtgtatatat 21240

atatatacat ataatgtaat acagcaacca ctaacaacac tatacaaaga gataataacc 21300

aaaaacaatt tagataaatt gaaatggaat tctaaaaaat attcaaatac tctacaggaa 21360

gacaagacaa aaagagaaaa aaagaggagg acaaactaaa ttttttaaaa acataaataa 21420

aatggtagac ttaagcccta acttatcaat aattacataa atgtaaatga tctaattata 21480

tcaattaaaa gacagagata gcagagttaa tttaaaaaca tagctataag aaacctgctt 21540

tgggctgagt gcagtgactc acacttgtaa tcccagcact tcgggaggcc aaggcgggtg 21600

gatcacctga ggtcaggagt tccagaccag cctggacaac atggtaatac cccatctcta 21660

ctaaaaatac aaaaaaatta gccaggcatg gtggcacacg cctgtagtcc caactactca 21720

ggaggctgcg acacaagaac tgcttgaacc cgggcagcag aggtagcagt gggccaagat 21780

tgcgccactc cagcctgaac gacagagtga gactccacct cagttgaaaa acaaaaaaga 21840

aacctgcttt aaatatacca acatatgttg gttgaaatta aaagaataaa atatatcatg 21900

aaaacattaa tcaaaagaaa ggagtggcta tattaataac ataaaataga cttcagagaa 21960

aagaaaattt caagagacag gaataaaagg atcaagaaaa gatcctgaaa gaaaagcagg 22020

caaatcaatc attctgcttg gagattcaac accctctctt aacaactgat agaacaacta 22080

gacaaaaaaa tcagcatgga gttgagaaga acttaacacc actgaacaac aggatctaat 22140

agacatttac ggaacactct acccaacaat agcaaaataa acattctttt caagtattca 22200

ctgaacatat ccttagaccc taccctgggc cataaaacaa agctcactag tgattgccga 22260

aggcttggat ggacagtgga agagctgcat ggggagggag aaggtgacag ttaaagagtg 22320

taggatttct ttttgggata atgaaaatgt tccaaaattg attgtggtga tgttggcgca 22380

actctacaaa tataaaaaag gccattgaat tgtacgtttt aagtgggtga aacatatggt 22440

atgtggatta tatctaacgc tttttaaaaa cttaacacat ttcaaagaat agaagtcata 22500

cagagtgtgc tctactggaa tcaaactaga aagaggtaac tggaggataa cgagaaaagc 22560

ctccaaatac ttgaaaactg gacagcacat ttctaaaatc atccgtgggt caaagatatt 22620

catttctgat attcattttt attgtttaat gtatttttaa aaatttctta agggaaataa 22680

actgactaaa aatgaatatg gctgggtgcg gtggctcacg cctgtgatcc cagcactttg 22740

-continued

ggaggccgag gctggtggat cacaagatca ggagttcgag accagcctgg ccaagatggt 22800

gaaaccccgt ctcaactaaa aaactacaaa aagtagccaa gcgcagtggc gggagcctgt 22860

ggtcccagct acttgggagg ctgaggtagg agaatcgctt gaacacaggc agcagaggtt 22920

gcagtgagcc aagattgtgc cactgcacgc cagcctgggc gacagagact gcctcaaaaa 22980

aaaaaaaaaa aaaaagaata tcaaaatttg tgggacatag ttaaagcaat gctgagaggg 23040

aaatttataa cactaaatgt ttacattaga aaagagaaaa agtttcaaat caatagtctc 23100

cactcccatc tcaagaacac agaagatgaa gagcaaaata aacccaaagc aagcaaaaga 23160

aagaaaatat aaaaataaat cagtaaaatt gaaaacagaa acacaataaa gaaaatcagt 23220

gaaacaaagt actgattctt cgaaagatta ataaaattga caaacctcta gcaaggctaa 23280

caaacaaaaa agaaagaaga cacggattac cagttattag aatgaaagca taattagaaa 23340

caactctaca cattataaat ttgacaatgt agatgaaatg gactaattac tgaaaaaaca 23400

caaattacca caactcaccc aatatgaaat agataattgg gatagcctga taactactga 23460

gaaaattgaa tttgtaattt taacactctt aaaacagaaa cattaaactt aatattttat 23520

aaatattaga taaggtaatt atacccttcc ttaacaaata aaaacgacaa attattttgc 23580

agctaaagag atgtatgtac tgtgaaaaat atcttcagaa aaatagaact ttgtttgaag 23640

aataaggatt taaaaaatgt ttttaactct caagaagcaa atatctgggc ccagatggtt 23700

tcactgaaga attctaccaa atgtttaatg aagaattacc accaactcta catagcatct 23760

ttgagaaaac tgaagagaag ggaacatctc ccagttcatt ttatgaagtg ggtgttactc 23820

tgatactaga actgtataag gacagctact cttgacacac tgcctatggg tagctctgct 23880

ctgcaggaac agtcagaaaa aaaaaaaaaa gaagcactgg acaagggcag tataaaaaaa 23940

gaaaactggg ccaggtgcag tggctcacac ctgtaatctc agcactttgg gaggctgacg 24000

ctggtggatc acctgaggtc aggagtttga gactagcctg gccaacatgg taaaaccctg 24060

tctctactaa aatacaaaaa ttagccaggc agggtggtgg ggaaaataaa aaggaaaaaa 24120

aaacaaaaat aaactgcaga ccaatatcct tcatgagtat agacacaaaa ctccttaaac 24180

tccttaacaa aatattagca agtagaagca atatataaaa ataattatac accatgatca 24240

agtgggactt attccagaaa cgcaagtctg gttcaacatt tgaaaacaag gtaacccact 24300

atatgaacgt actaaagagg aaaactacat aatcacatca atcaatgcag aaaaaagcat 24360

ttgccaaaat ccaatatcca ttcatgatac tctaataaga aaaataagaa taaaggggaa 24420

attccttgac ttgataaagc ttacaaaaga ctacaaaagc ttacagctaa cctatactta 24480

atggtgaaaa actaaatgct ttcccctacg atcaggaaca aagcaaggat gttcactctc 24540

attgctctta tttaacatag ccctgaagtt ctaacttgtg caaaacgata agaaagggaa 24600

atgaaagacc tgcagattgg caaagaagaa ataaaactgt tcctgtttgc agatgacatg 24660

attgtctcat agaaaatgta aagcaactag gggtaggggg gcagtggaga cacgctggtc 24720

aaaggatacc aaatttcagt taggaggagt aagttcaaga tacctattgc acaacatggt 24780

aactatactt aatatattgt attcttgaaa atactaaaag agtgggtgtt aagcgttctc 24840

accacaaaaa tgataactat gtgaagtaat gcatacgtta attagcacaa cgtatattac 24900

tccaaaacat catgttgtac atgataaata cacacaattt tatctgtcag tttaaaaaca 24960

catgattttg gccaggcaca gtggctcata cctgtaatcc cagcatttta ggaggctgag 25020

-continued

gcgagcagaa aacttgaggt cgggagtttg agaccagaat ggtcaacata gtgaaatccc 25080

gtctccacta ataatacaaa aattagcagg atgtggtggc gtgcacctgt agacccagct 25140

acttgggagg ctgaggcacg agaattgctt gaacaaggga ggcagaggtt gcagtgagct 25200

gggtgccact gcattccagc ctggtgacag agtgagactc catctcaaaa aaaataaaat 25260

aaagcatgac ttttcttaaa tgcaaagcag ccaagcgcag tggctcatgc ctgtaatccc 25320

accactttgg gaggccgagg caggcagatc acaaggtcag gagtttgaga ccagcctgac 25380

caacatggtg aaaccccatc tctactaaaa aatatataaa ttagccaggc atgtgtagtc 25440

tcagctactc aggaggctga ggcaggagaa tcacttgaac ccggaggcag aggttgcagt 25500

gttgagccac cgcactccag cctgggtgag agaacgagac tccgtctcaa aaaaaaaaag 25560

caaaataacc taattttaaa aacactaaaa ctactaagtg aattcagtaa gtctttagga 25620

ttcaggatat atgatgaaca tacaaaaatc aattgagctg gacaaaggag gattgtttta 25680

ggtcagtagt ttgaggctgt aatgcacaat gattgtgcct gtgaatagct gctgtgctcc 25740

agcctgagca gcataatgag accacatctc tatttaaaaa aaaaaaaatt gtatctctat 25800

gtactagcaa taagcacatg ggtactaaaa ttaaaaacat aataaatact gtttttaatt 25860

gcctgaaaaa aatgaaatac ttacatataa atctaacaaa atgtgcagga cttgtgtgct 25920

gaaaactaca aaacgctgat aaaagaaatc aaagaagact taaatagcgt gaaatatacc 25980

atgcttatag gttggaaaac ttaatatagt aaagatgcca attttatcca aattattaca 26040

caggataaca ttattactac caaaatccca gaaaaatttt acatagatat agacaagatc 26100

atacaaaaat gtatacggaa atatgcaaag gaactagagt agctaaaaca aatttgaaaa 26160

agaaaaataa agtgggaaga atcagtctat ccagtttcaa gacttacata gctacagtaa 26220

tcaagactgt gatattgaca gagggacagc tatagatcaa tgcaaccaaa tagagaacta 26280

agaaagaagc acacacaaat atgcccaaat gatttctgac aaaggtgtta aaacacttca 26340

acgggggaag atatgtctct cattaaaggg tgtagagtca ttgcacatct ataggcaaaa 26400

agatgaacct gaacctcaca ccctacagaa aaattaactc aaaatgactc aaggactaaa 26460

cataagatat acatctataa aacatttaga aaaaggccac gcacggtggc tcacgctcgt 26520

aatcccagca ctttgggagg ccaaggcagg tggatcacct aaggtcagga gtttgagacc 26580

agccggatca acatggagaa gccccatctc tactaaaaat acaaaattag ctggacgtgg 26640

tggcacatgc ctgtaatccc agctacttgg gaggctgagg catgagaatc gcttgaaccc 26700

gggggggcaga ggttgcggtg agccaagatc acaccattgc actccagcct gggcaacaag 26760

agcaaaactc caactcaaaa aaaaaaaaaa aaaggaaaaa tagaaaatct ttgggatgta 26820

aggcgaggta aagaattctt acacttgatg ccaaactaag atctataagg ccagtcgtgg 26880

tggctcatgc ctgtaattcc agcactttgg tcaactagat gaaaggtata tgggaattca 26940

ctgtattatt ctttcaactt ttctgtaggt ttgacatttt tttagtaaaa aattgggggga 27000

aagacctgac gcagtggctc acacctgtaa tcccagcact ttgggaggcc ggggcaggtg 27060

gatcacacgg tcaggagttc gagaccagcc tggccaacat ggtgaaaccc cgtctctacc 27120

aaaaatataa aaaattagcc gggtgtcatg gtgcatgcct gtaatcccag ctactgagga 27180

ggctgaggca ggagaatcac ttgaacctgg gaggtggaag ttgcagtgag ccgagattgt 27240

gccactgcac tccagccttg ggtgacagag cgagactccg tctcaaaaga aaaaaaaaaa 27300

-continued

aaagaatatc aaacgcttac tttagaaact atttaaagga gccagaattt aattgtatta 27360

gtatttagag caatttttat gctccatggc attgttaaat agagcaacca gctaacaatt 27420

agtggagttc aacagctgtt aaatttgcta actgtttagg aagagagccc tatcaatatc 27480

actgtcattt gaggctgaca ataagcacac ccaaagctgt acctccttga ggagcaacat 27540

aaggggttta accctgttag ggtgttaatg gtttggatat ggtttgtttg gccccaccga 27600

gtctcatgtt gaaatttgtt ccccagtact ggaggtgggg ccttattgga aggtgtctga 27660

gtcatggggg tggcatatcc ctcctgaatg gtttggtgcc attcttgcag gaatgagtga 27720

gttcttactc ttagttccca caacaactgg ttattaaaaa cagcctggca ctttcccccа 27780

tctctcgctt cctctctcac catgtgatct cactggttcc ccttcccttt atgcaatgag 27840

tggaagcagc ctgaagccct cgccagaagc agatagtgat gccatgcttc ttgtacagcc 27900

tacaaaacca tgagcccaat aaacctttt tctttataaa ttatccagcc tcaggtattc 27960

ctttatagca agacaaatga accaagacag ggggaaatca acttcattaa aataatctat 28020

gcagtcacta aacaaataag aacaagaggc tccagaagtg ggaagccaat acccagagtt 28080

cctacaatac agtatctgaa aagtccagtt tccaaccaaa aaatatatat atacaggccg 28140

gacatggtag cttatgtctg taatcccagc actttgggat gctgaggcgg gcagatcacc 28200

ctaggtcagg agttcgagac cagcctggcc aatatggcaa aaccccgtct ctactaaaaa 28260

tacaaaaatt agccaggcat ggtggtggat gcctgtaatc ccagctactc gggaggctga 28320

ggcagggaat cacttgaacc caggaggcag aggttgcagt gagccgagat cacgccactg 28380

aactccagcc tgggcaacaa agtgagactc cacctcaaaa aaaaaaaaaa tatacatata 28440

tatatgtgtg tgtgtgtgtg tgcgcgcgtg tgtgtatata cacatacaca tatatacata 28500

tatacagaca cacatatata tatgaagcat gaaaagaaac aaggaagtat gaaccatact 28560

ttctgtggtt atgataggat ggggtatcac gggggaagta gacaagggaa actgcaagtg 28620

agagcaaaca gttatcagat ttaacagaaa aagactttgg agtaaccatt ataaatatgt 28680

ccacagaatt aaagaaaagc gtgattaaaa aaggaaagga aagtatcata acaatattac 28740

tccaaataga gaatatcaat aaaggcatag aaattataaa atataataca atggaaattc 28800

cggagttgaa aggtagaata actaaaattt aaaattcact agagaaggtt caacactata 28860

tttgaactgg cagaagaaaa atttagtgag acaaatatac ttcaatagac attattcaaa 28920

tgaaaaataa aaagaaaaaa gaatgaagaa aaataaacag aatctcagca aaatgtggca 28980

caccattaat cacattaaca tatgcatact gagagtaccg gaagcagatg agaaagagga 29040

agaaaaaata ttcaaatgat ggccagtaac ttcctagatt tttgttttaa agcaataacc 29100

tatacaatca agaaactcaa tgaattccaa gtaggataaa tacaaaaaga accacaaaca 29160

gatacaccat ggtaaaaatg ctgtaagtca aaaacagaga aaatattgaa agcagctaga 29220

ggaaaactta taagagaacc tcacttacaa aagaacatca cttataaaag aaccacaata 29280

atagaaacag ttgacctctc atcagaaaca atgaatgata acatatttga agtgctcaaa 29340

gaaaaaaaat aaagattcct atatacgaca aagctgtctt tcaaaaatat acatccaaaa 29400

ggattgaaac cagggtcttg aagagttatt tgtacatcca tgttcatagc agcattattc 29460

acaatagcca aaaggtagaa gcaacccaag ggtccatcga caaataaata aaatgtggta 29520

tatgtataca caatggaatt tattcagtat taaaaaggaa tgaaattctg acacatgcta 29580

-continued

caacatggct aaaccttgag aacactatgc taagtgaaat aagccagcca caaaaggaca 29640

aataccatat tacttcactt gtatgaaata cctagggtag tcaaattcag agatagaaag 29700

taaaacagtg gttgccaagg gctgagggag ggagtaacgt ggagttattg ttgaatgggt 29760

acagaatttc agttttgcaa gataaaaaga gttctggaga cagatggtgg tgagggtggt 29820

acaacaatac aaatatactt tatactactg aacagtatac ttaaaaatga ttaacatggt 29880

gaaaccccgt ctctactaaa aatacaaaaa aattagctgg gtgtggtggc gggcacctgt 29940

aatcccagct acttgggagg ctgaggcagc agaattgctt gaaaccagaa ggcggaggtt 30000

gcagtgagct gagattgcgc caccgcactc tagcctgggc aataagagca aaactccgtc 30060

tcaaaaaata aaaaataaaa aaaatttaaa aatgattaag caggaggcca ggcacggtgg 30120

ctcacaccta taatgccagc actttgggag gccgaggcag gcgatcactt gagaccagga 30180

gtttgagacc agcctggcca acatggcaaa accctgtctc tgctaaaaat acaaaaatta 30240

gccaggcatg gtggcatata cttataatcc cagctactgg tgagactgag acacgagaat 30300

tgcttgaacc caggaggcag agattgcagt gagtcgagat cgcgccactg aattccagcc 30360

tgggcgacag agcaagattc tgtctcgaaa aaacaaaaac aaaaacaaaa agcaaaacca 30420

aaaaataatt aagcaggaaa cgagattgct gctgaggagg agaaagatgt gcaggaccaa 30480

ggctcatgag agcacaaaac ttttcaaaaa atgtttaatg attaaaatgg taaattttat 30540

atgtatctta ccacaaaaaa aagggctggg gggcaggaaa tgaaggtgaa ataaagacat 30600

cccagagaaa caaaagtaga gaatttgttg ccttagaaga aacaccacag gaagttcttc 30660

aggctgaaaa caagtgaccc cagagggtaa tctgaattct cacagaaaat tgaagcatag 30720

cagtaaaggt tattctgtaa ctatgacact aacaatgcat atttttttcct ttcttctctg 30780

aaatgattta aaaagcaatt gcataaaata ttatatataa agcctattgt tgaacctata 30840

acatatatag aaatatactt gtaatatatt tgcaaataac tgcacaaaag agagttggaa 30900

caaagctgtt actaggctaa agaaattact acagatagta aagtaatata acagggaact 30960

taaaaataaa attttaaaaa atttaaaaat aataattaca acaataatat ggttgggttt 31020

gtaatattaa tagacataat acaaaaatac cacaaaaagg gaagaagaca atagaactac 31080

ataggaataa cattttggta tctaactaga attaaattat aaatatgaag tatattctgg 31140

taagttaaga cacacatgtt aaaccctaga tactaaaaag taactcacat aaatacagta 31200

aaaaaataaa taaaataatt aaaatgtttg tattagtttc ctcagggtac agtaacaaac 31260

taccacaaat tgagtggctt aacacaactt aaatgtattt tctcccagtt ctggaggcta 31320

aacacctgca atcaaggtga gtacagggcc atgctccctg tgaaggctct aggaaagaat 31380

cctcccttgt ctcttccagc ttccagtggt tctcagtaac cctaagtgct ccttggcttg 31440

tagctatatc attcctagca accagaaaga agaaaataat aaagattatg gcaaaaaata 31500

atgaaatcaa aaggagaaaa atggaaaaaa ataaataaaa ccaaaagcta gttctttgaa 31560

aagatcaacc aagttaacaa acctttaac tagactgaca aaaaggaggt aagactcaaa 31620

ttactagaat cagaaataaa agaggggaca ttactaatga gggattagaa aagaatacta 31680

cgaacaaatg tgtgccaaca aattagaaaa cttagatgaa atggacaggt tcctaggaca 31740

acatcaacta ccaaaattta ctcaagaaga aagagacaat ttgaatgagc tataacaagg 31800

gaagagactg aattgacaac caagaaacta tccacaaaga aaatcccagg cccagaagat 31860

-continued

ttcactgtga aattctttca aacttataaa tataaattaa catcagttct tcacaaactc 31920

ctccaaaaaa aagaacagat ctctatttac aggcgatacg atctttagaa aatcctaagg 31980

gaactactaa gacactatga taactgataa acaagttcag caaggctgca ggatagaaaa 32040

ccaatataca aaaatctatt atatttctat acacttgcag tgaacaaccc aaaaatgaga 32100

ttaagaaaat aattcaattt acaataacat caaaaagaat aaaaacactc aaaaataaat 32160

ttattcaagt aagtgcaaaa cttatactct agaagctaca aaacactgtt aaaagaaatt 32220

aaaggtttac ataaatgaaa aactatccca tgttcatgga tcaaaagact tattactggc 32280

aatgctctcc aaattgatct ataaattcaa caaaatcctt atcaaaatcc cagatgaggc 32340

tgggggtggc ggttcatgcc tgtaatccca gcactttggg aggctgaggc acgcagatta 32400

cctgaggtcg ggagctcgag atcagcctga ccaacatgga gaaaccctat ctcttctaaa 32460

aatacaaaat tagtcaggcg tggtggcaca tgcctataat cccagctact cgggaagctg 32520

aggcaggaga atcgcttgaa cccaggaggc agaggttgca gtgagccaag atcgtgccat 32580

tgcactccag cctgggcaac aagagcaaaa ttccatctca aaaaaaaaaa aaaaaaaatc 32640

ccagatgact tcactgttga aattgaaaag attattctaa aattcacatg gaattgcaag 32700

accttgagaa tagccaaaac aaacttgaaa aacacgaaca aaatatagga tgactcactt 32760

gccaattgca aatgttacga cacagcaaca gtaatcaaga ctgtgtggta ctggcaaaag 32820

acacatacat acatacatat caatggaata taattgagag tacagaaaca agcctaaaca 32880

tctatggtaa gtgcttttct atttttttct ttttttttt ctttttgta gagatagaat 32940

ctcaccatgt tgcccaggct ggtcttcaac ttctgggctc aagcaatcct cccactgtgg 33000

cctcccaaag tgctgggata actggcatga gccaccacat ccagcccaga tgattttcaa 33060

aaaagtcaac aagaccattc ttttcaacaa ataggtctgg gatgatcaga tagtcacatg 33120

aaaaaaaaaa tgaagttgga ccctccatca cactaaagtg ctgcgattat aggcatcagc 33180

caccacatcc agcccaaatg attttcaaaa aggtcaacaa gaccattctt ttcaacaaat 33240

aggtctggga taatcagata gtcacatgaa aaaaaaaatg aagttggacc ctccatcaca 33300

ccatatgcaa aaattaattc aaaaatgaat tgatgactta aacgtaagag ttacgactgt 33360

aaaactctta gaaggaaaca tacgggtaaa tcttaaagac gttaggtttg acaaagaatt 33420

cttagacatg acaccaaaag catgaccaac taaggtaaaa tagggtaaat tgtacctacc 33480

aaaatgaaaa acctttgtgc tggaaaggac accatcaaga aatggaaagc caaaatagcc 33540

aaggcaatat taagcaaaaa gaacaaagct ggaggcatca tactacctga cttcaaagca 33600

acagtaacca aaacagcatg gtactagtag aaaaacagac acatagacca atggaacaga 33660

ataaagaacc caaaaataaa tccacatatt tatagtcaac tgatttttga caatgacacc 33720

ccttcaataa atgatactag gaaaactgga tatcgatatg cagaagaata aaactagacc 33780

cctatctctc accatataga aaaatcaact cagactgaat taaagacttg aatgtaagac 33840

ccaaaactat aaaactactg gtagaaaaca taaggaaaaa cgcttcagga cattggtcca 33900

ggcaaagatc ttatggctaa aacctcaaaa acacaggcaa caaaaacaaa aatggaaaaa 33960

tagcactttta ttaaactaaa aagctcctgc acagcaaagg aaacaacaga atgaaaagac 34020

aacctgtaga atgggagaaa atatttgcaa actatccatc catcaaggga ctagtatcca 34080

gaacacacaa gtgactaaaa caactcaaca gcaaaaaagc aaataatctg gtttttatat 34140

-continued

gggcaaaaga tctgaataaa cattctcaaa ggaagacata caaatgtcac tatcattctg 34200

ccagtaccac actgtcttga ttacttgtta gtgtataaat ttttaaattg ggaagtgtga 34260

gtcatcctac actttgttct tgtttttcaa gtttgttttg gctattctgg gagccttgca 34320

agtataaaat agccaacaag tatgaaaaaa tgctcaccat cactaatcat cagagaaata 34380

aaaatcaaga ccactatgag atatcctctc actccagtta gaatggctac tatcaaaaag 34440

acaaaatata atggatgctg gcaaagattt ggagaaaggg gaactcctat acactgtggg 34500

tagggatgca aattggtaat ggccattatg gaaaataata ctgaggtttt tcaaaaaact 34560

gaaaatagaa ctaccatatg atccagcaac cctactactg ggtatttatc caaaggaaag 34620

aagtcagtat actgaagaaa tatatgcact ctcatgttaa ttgcaacact gttcacaaca 34680

gccaagacag ggaataaatc taaatgtgca tcaacagatg aatggataaa gaaaatgtgg 34740

catatacact caatagaata ctattcagcc attaaagaag aatgaaatcc tgtcatccca 34800

gcaacatgga tgaacctgga ggacattata tttaatgaaa taagtaaagc acaaaaagat 34860

aaacagtaca tgttctcact cagacatggg tgctaaaaag aaaatggggt cacagaatta 34920

gaaggggagg cttgggaaaa gttaatggat aaaaatttac agctatgtaa gaagaataag 34980

ttttagtgtt ctatagaact gtagggcgag tatagttacc aataacttat tgtacatgtt 35040

caaaaagcta gaagagattt tggatgttcc cagcacaaag gaatgataaa tgtttgtgat 35100

gatggatatc ctaattaccc tgattcaatc attacacatt gcatacatgt atcaaattat 35160

cactctgtac ctcataaata tgtataatta ttacgtcaac aaaaaaagga aaaaaaagaa 35220

aattaagaca acccacataa tggaagaaat aaaatatctg caaattatat atatctgata 35280

aatatttaat atttataata tataaagaac tcctacaact caagaacaac aacaaaacaa 35340

cccaattcaa aaatgggtaa aagccttgaa tatacactta tctaaagact atatacaatt 35400

ggccaataaa gacacgaaaa gatgctcaac atcactagtc atcagggaaa tataaatcaa 35460

aaccacaatg tagaatgtag acaccacttc atatgcacta ggatggctag aataaaaagg 35520

taataacaaa tgttggtaag gatgtgaaaa aatcagaaac ctcattcgct gctgttggga 35580

atgtaaagtg atgcagccac tttggaaaac agtctggcag ctcctcaaat tattaaatac 35640

agagttaccg tatgacccag gaatattcct cctgggtcta taaccaaaaa aatgaaaaca 35700

tatatccaca taaaaacttg tacatgggca tttatagcaa cattattcat aacagcaaag 35760

gtggtaagaa cccatatgcc catcatctga tgaacaggta aataacatgc ggtattatcc 35820

atacactaga atattatctg cccatacaag gagtgacatc cagctacatg ctacaaggat 35880

gaatctcgga aaccttatgc taagtgaaag aagccagtca caaatgacca cagattatga 35940

ttccatgcat cggaaatgac cagaataggg aaatctatag agacagaaag tagattagtg 36000

gttgggtggg gctgggagga caggtagtac actactttcc cagaactact ggaacaaagt 36060

accacaaact ggggagctta aacatagaaa ttgatttcct cacagttctg gagactagga 36120

ctctgagatc aaggtgtcag cagagctggt tctttctgag ggccctgagg caaggctctg 36180

tcccaggcct ctctccttgg ctggcaggtg gccatcttct ccctgcgtct tcacatcatc 36240

ttttctctgt gtgtgcccat gtccaaattt tgattggctc attctgggtc atggccaatt 36300

gctatgcaca aagtgaagtc tacttccaaa agaagggaag agggaacact gactaggcta 36360

aacttatagt cattttaatg tccgcttttc ctatgagatt gtgaacacac agaagtaggg 36420

-continued

```
tttttatcta cattgtgcaa agtttaataa gaaaaataga attcaagaga agcagttcaa  36480
tagcaggaat ttaatatggg aactaattac aaggtttagg gcaggactaa aaagccagtt  36540
gggatggtga gccaacccag agattagcaa cagtgggacc ccatctacct accacccatg  36600
aagctggaag gataaaggag gggctattat cagagtccac aagccagtgt cagagtcctt  36660
ggctggagct gggaccaccc tagagacact gtgcaaagca gaaaacaagg gggaaaaacc  36720
ctgacttctc ccttcctccc acctttcaat ctcccactag tgcttcctac tagccatact  36780
tggccagaga cagtgacaag gaacactgca aaatgaagtt tgtaggaatc atctccctct  36840
gagacagaga aatatggaag ggtagaaaat gaatcagagg ataaagagaa aaaaccctga  36900
gtactatctt atttatcttt gtatctccag tgcctaatct gtctctcaaa aaaggaaagc  36960
aattgagaga aactgaaaac tccaattgaa atgaaagaat ggagaattac tggactagaa  37020
gagaagagaa aaatttattc cgcatagagt aaacaagaat ggattcacaa aggacgtgat  37080
gaatgaaaag ctataatcag caaagatttg ccagagaaat taaaaagtgg taaactcagc  37140
cacgctgtac aacctgaagg cacaatgcat gaaaacgttt caagaaatga caagatttga  37200
agtcaaattc taagtgcttt tccagaatct ctcaagacga ttatatagct accccatttt  37260
attaaataaa atggaaactt actaaacttt ccccttgtat taaactaaca tatgtcctaa  37320
tagcaaacga ttctggaatt cctagagtaa aatatatttc gtcaaagtgt attgctcttt  37380
taatattctg ctgacctcct tttgctattt aggatatttg tatacacatc acacgtaaat  37440
ttggtctata gtttacatct acgggcttat actgttcttt ttttcatttt tttaaaattt  37500
ccaaccccca gtatccatat actgctctct atcagggtta ttttaacttt gtaaaatcag  37560
ctgagatgct ttccatgttt ttttttttta ttttctgcca catttgaata gcataggagt  37620
taccaccatc aaccttggat tatttaagca ttcacgattc cacgtgtgga ttttttattc  37680
agagtctttc ttgtcattcc tgctatcagc acagaaccca atctcagctt tccagctata  37740
ctctcacccc atggaatttg cagatgaagt tcaaaaggac ctttgcatta tcctgcctcg  37800
ccctcttccc ccttcattta gacatcacct tcttctagaa cgtcttacct gacatgccct  37860
gctcccaacc cctgctgccc aattgtgtgc tctcccgtgt cctggcctgc catcctcttt  37920
agtaattgcc tgctccctca tctgtctccc cacccagaca ttaagctgaa tagactggat  37980
ttgtgtcttg tccatcacta taatctcagc acctagtacc tagtaggtac ttaccatgta  38040
ttcattagca aaatgttatg tataaccttg caccttaaaa acaagagaag gaagacaaaa  38100
ttaagtctta agactatggt ttagaacatg gatcagaaac tacagtctgc agcccaaatc  38160
cagaccaaat gaagagacca tgttcattta catacaacct atagcagctt tcacactaca  38220
ggagcagagc taagtagttc caagggaaca cacggccctg caaagcctaa aatatttact  38280
ctatagctct tcacagaaaa agttttcaga tccctcgttt agaactcttg ttcatatgca  38340
atttcactaa accatagttt tttgggtttg tttggttttt tttggcaaaa aggaatgagc  38400
cgatccagaa aaggttgaaa agaatgaatc attactgctg aaagaatgtg cacacagtcc  38460
gtcagtattc tgctgccatg ctgacaccca tccaatagtg tcatgagatg cagcagctac  38520
tactgtgttc tcaatgccga gtccacccac tccataacca tgtccaagca atcttgggaa  38580
catcatcacc atgcttgttt atccttaagg tattgcctca catacagcag tggctggtca  38640
taaagtcaaa tgacactagt ggccaggagg tcaagagaat gagtgaggac aggtgggtag  38700
```

-continued

gcagcccagg ccctagcaac agcaggagct cacccctcag tcactctagc caggactgaa 38760

atacttttca ccctttcaag agagactagg aatctggatt tttatgtgaa atatcttgat 38820

tactaaatgt tgtcaacaga catgtcaaaa ggtaaaacta agtaagttca tggggcagat 38880

tgactattca ggttatagaa ttaaggattc ttatccaaca cagataccaa ccaaaaagct 38940

gacgtataac atattaggag aaactatgtg cactgtcgaa acatcaacaa ggggctaatg 39000

tctaaaatag tctatattgg attccagttg aaacatgggg aaaggacatg aacaggcaac 39060

ttatgtcaat ggaaactcaa aaagataaca agcatatata aaagcattct caaattcagt 39120

agtaaacaga cagatgcaaa taaaaagagg gaaactgctg ccgggcacag tggctcacac 39180

ctgtaatccc agcactttgg gaggccgagg cgggcggatc atgaagtcag gagatcgaga 39240

ccatcctggc taacatggtg aaaccccgtc tctactgaaa acacaaaaaa ttagccaggc 39300

gtagtggtgg gcaccagtag tcccagctac tcaggaggtt gaggcaggag aatggcatga 39360

acccaggagg cggagattgc agtgagccga gaccatgcca ctgcactcca gcctgggcga 39420

ctgagtgaaa ctccatctca aaaaatataa taataattat aattataata ataataaata 39480

gtaaataaat aaaaagagag agactgctaa agtctagaaa gttgaatgat gccaagcgca 39540

tgcaaagatc agggccttgg gatggccggg tgcagtggct cacgcctgta atcccaccac 39600

tttgggaggc caaggcgggc ggatcatgag gtcaagagat caagaccatc ctggccgaca 39660

cagtgaaacc cggtctctac taaaagtaca aaaaaatata tatatatata tatattatta 39720

tattatatat atatatatca gagccttggg aatccttgtg tgctgctggg gaaggtagtg 39780

gtgcagccac ccttgacagc aatctggcag tacttggtta tattaagtat aggcacacac 39840

cacgaccagg cagtcctact cctgggtcta aatcccaaag aattctcaca caagtccata 39900

aggagacatg tacgaggctc attcagcatt actgggagtg ggaatcaacc tgggtgtcca 39960

tctacaggag acgagatgga caaaatgtgg tggatattaa gaccagaatc accaagtaac 40020

agagatgggt ggtgagtgac aatcctaaga tacagaataa aggctagaac atgatgccat 40080

tcatgtaaat taaaaatага tgcacacaaa gcagtatacg cgtgaccctt gaatagcaca 40140

ggtttgaact gcctgtgtcc acttacatgt ggattttctt ccacttctgc tacccccaag 40200

acagcaagac caacccctct tcttcctcct ccccctcagc ctactcaaca tgaagatgac 40260

aaggatgaag acttttatga taatccaatt ccaaggaact aatgaaaagt atattttctc 40320

ttccttatga ttttctttat ctctagctta cattattcta agaatatggt acataataca 40380

catcacacgc aaaataaatg ttaattgact gtttatatta tgggtaaggc ttccactcaa 40440

cagtaggctg tcagtagtta agttttggga gtcaaaagtt atacacagat tttcaactgt 40500

gcaggcaatc agttcccctg accccctcat tgttcacggg tcaactgtat atacacaaaa 40560

gtattatatg aacctcatta gaatagctgt ctatagggag aagagaatga gagtgggata 40620

aaacggaatg aacaaataaa ccaacaaatg cattaacaag caaaacaaca gaggggcttg 40680

catgggccag tgatgataaa gggctaagaa tgagaatata attaattcaa ttcctcacac 40740

ctgaggtcta aaaccaagga aagggagggc caggcgtgga ggctcacgcc tgtaatccca 40800

gcactttggg aggctgaggc gggcggatca caagattagg agtttgagat cagcctggcc 40860

aacacagtga aagcccatct ctacaaaaaa tacaagaatt acccaggtgt ggtggcacat 40920

gcctgtagtt agctactctg gaggctgagg caggagaatc acttgaaccc aggaggcgga 40980

-continued

ggttgcaggg agccgagatc acaccattgc actccagcct gggtgacaga gtaagactct 41040

gtctcaaaaa aataaaaaaa ataaaaaaac agagaaaggg aggaaactag atccaggctg 41100

actagataca gcctttagag ttagaaaaga tgatttgaca atctaagccc acactcagat 41160

tgaatgaaat tgaaaagcct ttcaaactaa aacatttaat tacaccatct gctgcagaca 41220

gaactcagac aactcaaaca ggtaatgtca gcgtggtgtt ttatatcacc accctcaaca 41280

cagaataaaa atcagctgca tgtgaagcag tgactagaat gaagaaaagg ctgcttctta 41340

cttccttcta gtggttcttt ccgaaaacat taataggcac cagctctatg catgtcaccc 41400

tgcagggaga catggggtat ataactatga cttactgttc attcctcaag gaattcccaa 41460

tcttgtggaa gattatacac aatgaggcaa caaaaactat ccaataaaac cacggaaaag 41520

aagccagtga caaagaagcc agtgatgaaa ggccctgtga gcagagctga tggccatttg 41580

gggaagaaag accaacatgg atgggggtga tcagggtggc tccgtgggaa agctggaaga 41640

gaagtggcag atctctgagc tggatgatgg gccactacca tctgtatatg gctaattaaa 41700

gaccatgtgt ggatttttta ttcagctctt tcgtgtcatt cctgctatca gcacagaacc 41760

caatctcaac tttccagcta tattgagcta aacttctcac ctcatggaat ttgcagataa 41820

agttcaaaag gatccttgcc ttttcaaaat aattttgaat ggttgagtag tccctctgtg 41880

ctctctcact gacaccctct caaggctgct gagcacgtgc catgctatgg ctttctccaa 41940

catcaggaaa tgttctccac tcagtttcac cttaatacaa atgtgttctc tcttcagaga 42000

aggcaaaaaa attcatgacc atctgactgg gagaagtcat ttctaggtaa agtgtccatc 42060

tttttctgag gaacacagga ggaaaatctt acagaaaaga gttaacacag caggcctaag 42120

actgcttttt aaaataaata aataaataaa taaataaata aataaataaa taaataaata 42180

aataaatgaa tgatagggtc ttctgtattg gccaggctag tctcaaattc ctggcttcaa 42240

gagatcctcc caccttggtc tcccacagtg ttgggattat agacatgagc cattgtgctt 42300

ggcccaagac tgttattctt aaaaagtctc ataaaaagca tggttaatcc ttggctggca 42360

cctgggaact tagatttcag aagggttccc accatccaac ctggaaagag ggactcactg 42420

tgcctaaatt attgtgtggt ttatgctgaa ctcctgcttt tcttcaggta gcgtggaatg 42480

tggtatgtgc tgggcaaagg gggcctgcat gaccagcccc caataaaaac cctgggtgtt 42540

gggtctctag tgagtttccc tggtagacag catttcacat gcgttgtcac agctccttcc 42600

tcggggagtt aagcacatac atcctgtgtg actgcactgg gagaggatgc ttggaagctt 42660

gtgcctggct tcctttggac ttggccccat gcacctttcc ctttgctgat tgtgctttgt 42720

atcctttcac tgtaataaat tacagccgtg agtacaccac atgctgagtc ttccaagtga 42780

accaccagat ctgagcatgg tcctgggggc ccccaacaca gaaataaatt ataaaagacc 42840

aaggactggg catggtggcc catgccggta atctcagcgc tttgggaggc cgaggcagga 42900

ggaccagtta agcccaaaag ttcaaagtta cagtgaccta tgactgcgcc aatgcactct 42960

aacctgggag acagagcaag accctgtccc caaaacaata aactaaacac atacttctgc 43020

cttccaagtg tcttaaaatt caatggaatg gtagaaacat ttttaaaaca ctaaatcaaa 43080

agaaacctgg aaaacaagag tgccgatggc caactaaaat gtctaggaaa tttctgaaaa 43140

gtaaaaagta ctcagaacca gattacctga gcaaaccata gcccaataca agcttgggag 43200

gaggctgtta tgcagaagga aatggtaaca ggtttccagg aacagacttg taacagcaga 43260

-continued

tagaacagca gaggtagaac ctgacaaggt gattacctgg ggaactgcag tctgaatgac 43320

caggactgtt ggaccettcc cctcacatgg aatacacacg ccactcagca gcacaccaca 43380

gctcttcaac aatcacagga ggcacgctac gcctagtaag acaggaaaaa aggaattctc 43440

aaacttcgaa gatgaacaca taaagaatca ccaagttttt attcagtatg atgaaacagg 43500

gacactgaat caacagaaca caaacccaag caaagataat tactagagca catagaagaa 43560

attattagat attcttggga agacctaagg ggacattata aagagcaagc agttggtatg 43620

tgacgatctt tgtgatatac caagaaataa aaacacagga tgaagaccag atagagaata 43680

atgctactat ttgtgcaaaa aaggagaaat ggagaatctg attcatattt gcttgtattt 43740

gcatgaagaa actttggaag gtacataagt aactaacaac aatggttacc tacttgtaag 43800

gcgagagaag taagaggaca ggaatggtgg gaacaccttt tgtgtccgga attggtgggt 43860

tcttggtctg acttggagaa tgaagccgtg gaccctcgcg gtgagcgtaa cagttcttaa 43920

aggcggtgtg tctggagttt gttccttctg atgtttggat gtgttcggag tttcttcctt 43980

ctggtgggtt cgtagtctcg ctgactcagg agtgaagctg cagaccttcg cggcgagtgt 44040

tacagctctt aaggggggcgc atctagagtt gttcgttcct cctggtgagt tcgtggtctc 44100

gctagcttca ggagtgaagc tgcagacctt cgaggtgtgt gttgcagctc atatagacag 44160

tgcagaccca aagagtgagc agtaataaga acgcattcca aacatcaaaa ggacaaacct 44220

tcagcagcgc ggaatgcgac cgcagcacgt taccactctt ggctcgggca gcctgctttt 44280

attctcttat ctggccacac ccatatcctg ctgattggtc catttacag agagccgact 44340

gctccatttt acagagaacc gattggtcca tttttcagag agctgattgg tccattttga 44400

cagagtgctg attggtgcgt ttacaatccc tgagctagac acagggtgct gactggtgta 44460

tttacaatcc cttagctaga cataaaggtt ctcaagtccc caccagactc aggagcccag 44520

ctggcttcac ccagtggatc cggcatcagt gccacaggtg gagctgcctg ccagtcccgc 44580

gccctgcgcc cgcactcctc agccctctgg tggtcgatgg gactgggcgc cgtggagcag 44640

ggggtggtgc tgtcagggag gctcgggccg cacaggagcc caggaggtgg gggtggctca 44700

ggcatggcgg gccgcaggtc atgagcgctg ccccgcaggg aggcagctaa ggcccagcga 44760

gaaatcgggc acagcagctg ctggcccagg tgctaagccc ctcactgcct ggggccgttg 44820

gggccggctg gccggccgct cccagtgcgg ggcccgccaa gcccacgccc accgggaact 44880

cacgctggcc cgcaagcacc gcgtacagcc ccggttcccg cccgcgcctc tccctccaca 44940

cctccctgca aagctgaggg agctggctcc agccttggcc agcccagaaa ggggctccca 45000

cagtgcagcg gtgggctgaa gggctcctca agcgcggcca gagtgggcac taaggctgag 45060

gaggcaccga gagcgagcga ggactgccag cacgctgtca cctctcactt tcatttatgc 45120

ctttttaata cagtctggtt ttgaacactg attatcttac ctatttttt ttttttttt 45180

tgagatggag tcgctctctg tcgcccagac tggagtgcag tggtgccatc ctggctcact 45240

gcaagctccg cctcccgggt tcacaccatt ctcctgcctc aacctcctga gtagctggga 45300

ctacaggcaa tcgccaccac gcccagctaa ttttttattt tatttttttt ttagtagaag 45360

cggagtttca ccatgttagc cagatggtct caatctcctg acctcgtgat ccatccgcct 45420

cggcctccca aagtgctggg attacagacg tgagccactg cgccctgcct atcttaccta 45480

tttcaaaagt taaactttaa gaagtagaaa cccgtggcca ggcgtggtgg ctcacgcctg 45540

-continued

```
taaccccagc actttgggag gccgaggcgg gcggatcacg aggtcaggag atcgagatca  45600
tcctggttaa cacagtgaaa ccccgtcgct actaaaaata caaaaaatta gccgggcgtg  45660
gtggtgggca ccggcagtcc tcgctactgg ggaggctgag gcaggagaat ggcgtgaacc  45720
tgggaggcag agcttgcagt gagccgagat agtgccattg ccttccagcc tgggcgacag  45780
agcgagactc cacctcaaaa aaaaaaaaaa aaaatagaga cccggaaagt taaaaatatg  45840
ataatcaata tttaaaaaca ctcaagagat gggctaaaga gttgacggaa caaatctaaa  45900
tattagattg gtgacctgca aaaccagccc aaggaacatc ccagaatgca gcccataaag  45960
ataaagagag catttccgct gggcacagtg gtatggcagg ggaattgcct gagtccaaga  46020
gttgcaggtc acattgaacc acaccattgc actccaggcc tgggcaacac agcaatactc  46080
tgtctcaaaa aaaaaaaaaa ttaaattaaa aaagacagaa tatttgagag aaaaaaatgc  46140
ttatttcaag aaacatgaaa gataaatcaa gatattctaa ttcccaagta agaataattc  46200
cagaagcaga aaatagaata gaggcaagga aacactcaaa acttctccag tgccatagaa  46260
atgtgtatta atctttagaa tgaaacggac taccaaatgc tgagcaggaa gaacaaaaga  46320
gatccactct taagccagtg tggtgcccaa gcgcagtggc tcatgcctgt aatcccagca  46380
ctttgggagg ccgaggcagg tggatcacct gaggtcagga gtttgagatc agtccaggcca  46440
acatggtgaa accctgtctg tactaaaaat acaaacatta gctgggtatg gtggtgcaca  46500
tctgtaatcc caactacttg ggaggctaag gcaggagaat cacttgaaac caggaggtgg  46560
aggttgtagt gagccgagat catgccacac tcccagcctg ggtgacagag caagattcca  46620
tctcaaaaaa aaaatccact cctagacaaa taatagttaa attttagaac accaaggaga  46680
aagaaaaaaa attgtaaagc ttcagagaaa ataaacatta actacaaaga aacgagagtc  46740
agacgcgtgc acttcttcct agataccagc agataaagca atatctccaa aattcagaag  46800
gttttaacgt agaatcctat acccagtcaa gaatattcac atggaaaagt gaaataaaaa  46860
acattgttta aacatgcaag ggttcagaaa gtttaccatt cacagaatcc ctgaaaacaa  46920
aaccaaataa tcacttaagg actcattaag aaaacaaatg aaataaaagc accaatgatg  46980
agtaaataat cagaaaaatt tacagtttac ctaaataact gtttatgcat aatgtatgaa  47040
aacccaaaaa tttaatatgg gacagaatta aaatcatgat aagattcttt tttgctttac  47100
tcatggagag ttcacataaa cagattatct tttaatagca agagaaaaaa atgtttagat  47160
atgtgtgaaa aactaagggt accaaaacag tgcaaattca tttatcatca ggaaaatcca  47220
aattaaaacc acagtatcca ccagaataac taaaaggtaa aagacagaaa ttaccaagag  47280
ttggcaagaa tgtggagcaa ccacatatac ttctggggta aataagttgg tgcaaccggt  47340
actgaaaact gtttgctagt atctactaaa accgagcaca tgcacagact acaaccaagc  47400
agttccactc ccagatacac actcaacaga aatgcacaca ctcactcaac aaaagacgtg  47460
tactagagtg ttcatgtact tactattcat aatagtccaa aaatgcaaac aaccaactgc  47520
caatcaaagt caaatgtata tctatattag ggatatatac aatggcatat acacagcaat  47580
gagaatgaaa tgaaccagct cggcacagtg gttcatgcct gtaatctcag cactttgggc  47640
gggtaaggca ggcagatcac ttgaggtcag aaatttgaga ctagcctggc caacacggtt  47700
aaaacctgtc cccactaaaa acacaaaaat tagccgggca tagtggttgc aggcctgtaa  47760
ttccagctac tcgggaggct gggttgggag aatcgtttga acccgaaagc cggaggtcgc  47820
```

-continued

agtgagcgga gatcgtgcca ctgcactcca gcctggacga tagagcaaga ctccgtctca 47880

aaaaaggaaa tcaaaaatat aaaataagat gacaggaata atccgcaaaa gatcagtaat 47940

caaaataaat ataaatgggc taaagctacc tattaaaaga caaagatttc acacccataa 48000

ggatagctac tatcaaaaaa agagagagaa taacagatgt tagcaaggat gtatggaaac 48060

tgaaattctc acgcattgct ggtgagaata taaaatggtt cagcctctgc ggaaaacact 48120

atgctgggtc atcaaaaaat taaaaataga agtactactt gatccaacaa ttctacttct 48180

gggtatatac ccaaataact gaaagcaggg tcttgaagag atatttgtac acccatgatc 48240

atggcagcat tattcataat agctatgatg tggaaccaac ataaatatcc tttgataaat 48300

atatggataa gcaaaatgtg gtgtatacat tcaatggaat attaattagc aataaaaatg 48360

aagaaaattc tgacacatgc tacaacatgg atgaaccttg agggcattac attaaatgaa 48420

ataagccagt tataaaaaga caaatactat atgaggtact atattagata ctcatgcaag 48480

gtacctaaaa taggcaaatt catagagaca aaaagcagaa tggtggttgc caggggctgc 48540

ggtaatggat acagagcttc aattttgtaa gatgaaaaaa ttctggagat tggttgcata 48600

acaatgtgca cacacttaac actggggaac tgtaaactta aaagtagtaa atggtaaaaa 48660

taaaaataat aaataataaa ttttatgtta ttttaccaca atatttatta aaagacaaag 48720

attaactaat taaacaaaat ccagccataa gctaatggta agagtaacaa ttaaagaaga 48780

cacagaaaat tgaaaatcag tgactagaaa aagatattcc atataaatgc taacaaaaag 48840

caagtacagc aatataaaga gaatgaacaa aaaaaaaatt aaataagatg gctcgtttat 48900

tcccaaaagg tacaattcac caagaagata caagaattgt gaacctttaa gcacataaaa 48960

cagcttcaaa aatacaacat ttaaagaaaa atatatatta aacatagaaa tagtacaaaa 49020

acccctacaa gaatcataat gggagtcttc aatacaactc tccatatcaa caggtcaaac 49080

agagaaaaaa aataagttaa ggatgcagaa aacctgaatt accatcaata aacttgagat 49140

taatatagaa ctgtataccc aatatactaa gagttcaggg aacagtcgtg actgacagtg 49200

gactgcaaat taatctgttc ttaatctttg tttttctttc agcactgtgg cagaatagag 49260

atcctaaaaa ccttccagct acaaaacatc tttttaaaaa tataaaaaaa tacaaaaata 49320

actctgaaat caatagaaga cacatggtga aaccaaaatt ctagaataca gggagaataa 49380

aggcattttc agatattaca aaaacagaaa attgatcatt gctgaagtaa tttctaaaga 49440

atgtacttga gggagaagaa aaatgttcca aagaaaagta tctgtgatac aagaaggaat 49500

ggaaagtgaa gaaatggtaa acaggtagat aaagctaata aatgttgacc tagaaaataa 49560

caaaaacaat agcaataatg tctcgttgga agggttgaag taaaaataca attaaggcca 49620

aatgtgaggt aagtggaatg aaagaattag aagtccttgc cttgttcaca ggactgatta 49680

aataaatgag ccaggttttc cattcaaaca gttaaaactt gaacaaaata aactcaaatt 49740

aagtagaaag ataaaaaaca gaaattaatg tcatagaaaa ataaaaaatc aatagaatta 49800

atcaataaat cctggttaat aaaagctggt tctttgaaag gattaataaa ataatcatta 49860

agcaagtctg atcaaaaaaa aagagaaaag gtaccaaaaa aagtactgta tcagaaagag 49920

aacatacaga tacatacaga tatgtaagag tctgttttct tacaccagaa tactatatac 49980

aacattatgc tagcatatat taaatttcaa taatgttaat gattttctag gaaaacagaa 50040

aatattaaat ttactttgaa gaaacagaaa aactgagaaa aataaatgat catgaaaaaa 50100

-continued

atgaaaaggt aattaaatac tgatattaac tgcctaaaca acaccagcag cagcccaggc 50160

agtctgcagt caagttctgc caaacttgag ggaacagata attcttctat tccagagcat 50220

agaaaatgat ggaaagtttc ccaatttaat cagagaggac agcctgatcc ttgttatgaa 50280

cacagataaa aatggggtaa actatatgcc aaactcagat accaaaaccc taaataagat 50340

gctagcttat tgatgtgaac aatccaaaag tgcattttaa attagcccag ggttttagag 50400

aaagaaaatc tagcaatgtg accaccactt atgttaacaa ttttaagacg aaaatctaca 50460

tgatcatatc aatgcatgct acacaaaagc atttgggcaa aaaacccaac acccaccctt 50520

gacttttaa actcttagta attaggcata aacagaaatg tacttaatgt gatagaatac 50580

actcggtgaa gatacagagg gaatgctccc taaaaccaag cccaagacaa agattcctat 50640

ttaacctcaa tagtcaacac tgcagcgaga gtaatctatg gaagacaagg aaaaaagtaa 50700

aaacatgaga gacatctgtt gtttaacaga caataagatc acctacttgg aagaggcaaa 50760

cgaatcaagc gaaaaactat taaaactgag acaggcttta gtatggaggc tcagcttcag 50820

ctgtagtttg ggctaccaaa ttcaactcgc ttgcttggag agttaatcct gcaaagctaa 50880

tttctgttga ggtattagga ttgacaagcc tgtgctcctc cctcctcccc catcttcaac 50940

actgaaataa cacggtgttt ggaactggat aacagaatct tccaaaaaca aaaattgtcc 51000

tgaagggctg acttgtgccc ttactcaaaa aacactttat ctgctgcctg cagctcctac 51060

agttgctggt ggataagcct gccaaccagc tcggcgtaat tcttcctgca gagggcaagg 51120

aagagcactt tcacaggaaa attttttttcc gaactgtatg ccgcttatta cataaactta 51180

cgtgctggca aatggagctc cagcaaaata agatattcag agtcaaactt ccttaggaaa 51240

aaaaaaaaaa aaaagcaagc acataacact aatttccttg catgggcact ggggaaggag 51300

gtcgttactt ccgcacgccc gcaggtccgc accaccggga aacccacggg caccgcgcgc 51360

tgccccggg ccttccaggt gcactgcgcc gcggcgcccc agctgacccg ggatgcgcag 51420

ccctagccct tcccctgtca ccccggccag gaaggggcgg gagcgcggcg gacgccgagg 51480

gcgaagggct tctcggtcct ctgcaccacg cagcaccccc aaggcacaac agggagggtg 51540

cgggaggctc ccgagaccca ggagccgggg ccgggcgtgc ccgcgcacct gtcccactgc 51600

ggcgagggct ggggtcgcct ccagggccgc agctgtcggg agccacctgg ctctcagtcc 51660

cgggtccctg cgacaaccct cgggcccgga ggggaggagg cggccacctg ccgctgccac 51720

ctgcggcacc ggtcccaccg ctccgggccg ggcaggacag gccaggacgt ccctcctggg 51780

ctggggacag gacacgcgac gaggggaccg gggcccccgc ggcgaagacg cagcacgcct 51840

tcccagaaag gcagtcccgt gcccccacga cggactgccg gacccccgcg ctcgcccgcc 51900

catcccttca gaccacgcgg ctgaggcgca aagagccggc cggcgggcgg gctggcggcg 51960

cggctagtac tcaccggccc cgctggctca gcgccgccgc aacccccagc ggccacggct 52020

ccgggcgctc actgatgctc aggagaggga cccgcgctcc gccggcgcct ccagccatcg 52080

ccgccagggg gcgagcgcga gccgcgcggg gctcgctggg agatgtagta cccggaccgc 52140

cgcctgcgcc gtcctccttc agccggcggc cgggggcccc ctctctccca gctctcagtg 52200

tctcatctcc ctatctgctc atcctctggt cgcacataat cgatgtttgg gcgtcccaag 52260

ccagatgtgg accccatttc cgcactctac actggaggtt ttctaagggt ggtgcccgga 52320

ccagcagctt cagcctcatc tgggaacttg agaaaatgca gattctccgt cccacccagc 52380

-continued

ctattcggtt tttcctgcac taaaaccatg aaggtggggc ccagcagtcc acattctcgc 52440

aagcccgtca agtgattctg aggcgccctc cagtttgaga gctatgctca cggcctcacc 52500

tccgccccgc aaggagcccg gtcttgcctg tggcgctagc cgcacacgga cacctcatcc 52560

tgcggggccc gccccccccgc tgcaccctca ccgcccaacg cctcctccgg gatgcagcgg 52620

aggcgcctgg aagtcggcaa ggtcaacatc cccctcagca tcttccctac cctcacggct 52680

cctcctccag gggtgcctca tggccagggg ttagaaagag ccactgtgtt tcttgacatg 52740

gaagtggcct aagaccttaa tgaaaactgc aggagtggaa tgacagaacc tttggtcata 52800

cttgagggcg tgaagctcaa atgaggagga aggaaaggat ccagggagaa taaccaaccc 52860

tggcaagttg tggcgcccag gtagaggggc gagcctaggc tagcggttct cgaccagggc 52920

cggtgttgcc cctcctcgcc gccccgcgta catttgggga ggtctggaga catttttggt 52980

tgtcatgatg cgggagttgc tactgttgcc taagtgggta gacacgaggg tgctcctcaa 53040

catcctacct gaaggacagg actgccccac aaggaagaat gatccggccc caaataagaa 53100

accctgggct ggtcagcaac aacccctttg ttctgagaag agaggaggaa agaataaaag 53160

aagtggggtg aagttttggt ttggtagagg aaacttgaag acattttcac tggaaaggaa 53220

gagaggaaga ggagggagat gtctgtaagg acgagcaaac cgggtgacag ctgatttcct 53280

catattgaag taatgagtcc tagttataat aaattcctaa taaaaaccca gtttatccct 53340

gcaataaact tgtctttttt ttttaaatat actgcttgat tctgtttgct aatattttat 53400

ttacaggctt tgcattgata tgcaaaaatg agatgggcaa taattttctt tttgaatgtc 53460

taatgttgtt tggtttcaga atcaatgtta tgctcacatc ataaaaaatt tggaaccgag 53520

gcaggaggag tgcttgaggc cagaagttcg agaccagtct aggaaacaca gtgagacccc 53580

cccatctcta caaaaaaaaa aaaagaaaaa aaaatgggca tgtttgcttt ttcctttcac 53640

tctgaacaat ttaaggagca ttaaaattat ctattctttg aggtttgatc atttcccagt 53700

taaaaatgtt cctcccagcc tgatgctttc tttggggagg gtaaatcttt taaggctaga 53760

aaagtttctt ctgtggcaat tttattattt acattttaaa aattattcta gagttaattt 53820

tgataaagca tgtatttctt aaaacaaatt atcctttttt tccagatgtt caagtgtatt 53880

tgcataaagt tgaggaaagt agtcttttgt gaatctttta acttctccca aatatcttat 53940

tttgtgtatt tttgcttctt tattttgtta acttttaaaa gtgtattttt ttttcaaaga 54000

atcagctctt aggtttatgt ttttggttat actggagctt ttttcttctt ctttttaaaa 54060

tatttttttct cctttatttt ttagacgtat tttgatctaa cgtaatcgga agaaggtaaa 54120

ttagaatctt ttgttactat tgtgttttta tttctcctta tttctctgaa gtcctgcttt 54180

ataaatagta ccatgttatt tgtgcataaa tattcatttg tcttatattc ttgggaattt 54240

tcccacttca tcataaaatg accttccttg tctcatttaa tgtgttcaaa ctttgccctg 54300

aatttaactt tgtctgatat tttaccatcc tgctgaattt tgtttgttac cccaaacaac 54360

ctttgctgtt ttcgtctttt ctgaaccctt tattttaggt aatcccttga attagagcac 54420

taagttttgc tttgtgatta aatctgaaaa tctttatctt gccatagatg agttgagccc 54480

tattcatgtg acagctatat tatgctgttt catagccctt ttggtccttt tttcactctt 54540

gcattgcata ttttgtgttt attgtgtttt gtgtttcttc tgataatttg gaaggtttgt 54600

atttttattc agggagttgc cttataatca tactccgcaa tacacatcgt cctcagtttc 54660

-continued

```
ttcagactgt ctgttaactc cctattctga ataaaaatga cattgtaatt tccctctttt  54720
ttctttaccc cttttcttct cctcacctaa tgtaaatgat tttatccttc tttagtattt  54780
gcttttttaa ttaactacat ttataaatat ctttatcact tgatttttaa atcagctttg  54840
aatgagatat ttggattcct agatataaaa gatgttaatt ataccatttc cacgttagta  54900
ggtttataaa atcatacatt ctgctgtgta accataatcc cacgtttgtt ttagttccac  54960
tcctacagtt aaaagattca gaagtattat taacagttat tttgccatag ttttttcccc  55020
aacccatttt gtggtaagtt atgatcctgc tttagtttct taagaataat ttatagagca  55080
gagtgtggtg gctcacgttt gtaatcccag cactttggga gacaagaggt agaaggatcg  55140
cttgaagcca gcagttcaag accaccctga gcaacatagt gagaccttgt ctctacaaaa  55200
aattttaaaa tttagccaga cgtagtggcg tgtgcctata gtcccagcta ctcaggaggc  55260
tgaggcaaga ggattgctag agcccagaag tttgaggctg cagtgacctc tgattgtgcc  55320
actgcacccc agtctgggca agaaagtgag aacctatctc tttaaaataa caataataac  55380
ttatgaaaat tatattccct gagtttttca tgtttaaaaa tatttgttgc ctttatcctg  55440
taaaagtttg agtataaatt cttgggttat actttattta ttgaagaatg tataagtatt  55500
gtcttctaga attgagtgtt gctgtaatga aacccagaagt cagcctggtt tatttttcct  55560
cagaaatgag gtaattgccg gccggacacc gtggctcatg cctgtaatcc caacactttg  55620
ggaggccgag acaggtggat cacgaggtca ggagattgag accatcctgg ctaacatggt  55680
gaaaccccgg ctctactaaa agtacaaaaa gttagctggg catggtggtg gacgcctgta  55740
atcccagcta cccgggaggc tgaggcagga gaatggcgtg aacctgggag gaggagcttg  55800
cagagagctg agatcgcgcc actgcactcc agcctgggcg acagagtgag actccgtctc  55860
aaaaaaacaa aaaaaaaaca aagaagtgaa gtaattgcca tgatgctcca agaattatct  55920
ctttgtctat gaaatccaga aatctcactg ttatacattt tggaattatt attctgggcc  55980
aatatttcct gggacacaat agattgactc tatagattta attttttttt ttttttgag  56040
acagagtctc actgcaatct cagcttactg caacctctgc ctcacgggtt caagcaattc  56100
tcctgcctca gcctcccaag tagctgggac tacaggcgcg tggcaccatg cctggctaat  56160
ttttgtcttt ttagtagaga cagggtttca ccatgttggc caggctggtc ttgaacgcct  56220
aacctcaagt gatccacctg cctcagcctc ccaaagtgct gggattacag gcgtgagcca  56280
ccatgcccag cctcaattcc tctttctatc tggtaatttt tctgaagttg aaaacatttg  56340
ttctaatacg ttatttcagt gttcttctaa gatgtgtaaa gcaccctatt cccaggtcag  56400
cccccatctt gctagtgagc tcggctggtt cttcacaaga gctctggttt tctcctgctt  56460
aatctcaagt acctctgtca gcctccacct ggtttatgat ttggagtttt ttggtttttg  56520
ttttttgttt ttgacagagt cttactctgt cacccaggct ggagagcagt ggcataatct  56580
cagctcactg caacctctgt ctcccaggtt tgagcgattc tcctgcctca gcctactgag  56640
tagctgggat tacaggcgcg tgccaccaca cccggctaat ttttgtattt ttagtagaga  56700
tggggtttca ccatgttggc cagggtggtc ttgaactcct gacctcaggt aatccacctg  56760
cctcagcctc ccaaagtgct gagattacag gcgtgagcca ccgcgcctgg catggtttgg  56820
agttttaatc tgtagtttta ataaagatag tgcttatgtt tgtgtttctt atatttcttg  56880
gtactcttgg gtaatttgta agatccccat atctacacaa gaagtccatt ttcaattctt  56940
```

-continued

ttcttcagac tgtttatttt attttatttt attttatttt tatgtttgag atggagtctc 57000

gctgtgtcac ttctggaggc tggagtgcag tggcgcgatc tcaggtcact gcaacctccg 57060

tctcccgggt tcaagcaatt ctcctgcctc agcctcccga gtagctggga ttacaggcac 57120

ctgccacttt ttaatttttt tagagacaga gtctcgcttt gttgaccagg ctggagtgcg 57180

gtggtgcaat catggctgac tataacctcc aaatcctggg ctcaagtgat cctcctgcct 57240

cagcctcctg agtagctggg actacaggca catgccacca tgcccagtta attttaattt 57300

ttttgtagag acagggtctc catatgttgc ccaggctggc ctcctactcc tggcctcaag 57360

taatcctcct acctcagcct cccaaattac taggattata agcatgagcc accatgccca 57420

gccttgttct actactttaa tttcatatgt taggtgacca tgtaattgat catccaaacc 57480

aggatactgt aagaatgaaa gaggctgaca gtagtatgat gctgggacta gcattgtgca 57540

ctgagattat ttctgggaaa gcaggagata cggtcaccct acttatagtg tgcttgtctt 57600

tggattgttg aatttggagt ttctatttgc aggcttattt caactgggca gccttgatcc 57660

gccctgccca gcaatgctac cgttctctcc accgggtctc tgggacccct tcagtcacta 57720

tacttagctc agttccccac cctcccactc cctaaaagcg taaccaggaa tcctgcctca 57780

ggtctactgc cgtcttccgt gggctgtttc agttcctatt acccagagtc aaactcccag 57840

cattccctac ctgattccag acttggagtc cagagcttta acctcttcag gccaactccc 57900

cactttgcat ttctgtccct atatcttagt ccatggagat acatttcatg tctttgagtc 57960

tacttacaaa gtaaattttg ctgtttttta attttttttt tgagatggag tcttgccctg 58020

tcacccaggc tgtggtgcaa tgacgccatc tcggctcact gcaacctccg cctcctgggt 58080

tcaagcgatt catctgcctc agcctcccaa gtagctgtga ttacagacag gcaccaccac 58140

gcccagctaa ttttttttat ctttagtag agacagggtt tcaccatgtt ggccaggctg 58200

gtcttgaatt cctgacctcg tgatctgccc atctcggcct cccaaagtgc tgagattaca 58260

ggcgtgagcc actgtgccca gccaattttg ctttttttat atttcattgc tatatgttta 58320

gaggataagt ttacagtgct atatgcattc ccaaatatta gaccaaaaaa atctccaaaa 58380

aattagaaag aaaatccaaa aaatctcaaa aaataccaaa aagcaacaat ctcacagacc 58440

atactcactg acccccaata aaataaaatt agaaattaac cacaacttaa caaaataaag 58500

tactcaagtc agagaggaaa gaggaaataa acatcaaaat tacaaagtct aggcggtggc 58560

tcacgcctgt aatcccagca ctttgggagg ccaaggcggg cagatcacaa ggtcaggaat 58620

tcgagaccag cctggccaat atggtgaaac cccgtttcca ctaaaaatac aaaaattagc 58680

caggcatagt gatgtgtgcc tgtaatccag ccacttggga ggctgaggca ggagaatcac 58740

tgaacccagg gagacgaaga ttgcagtgag ccaaaatcgt gccactgcac ttcggcctgg 58800

gtgacaaagc gagactccat ctcaaaaaaa aaaaaattac aaactcttta gatagaaatt 58860

ttggtgtttt tttttgagac ggagtctcac tctgtcgcag aggctggagt gcagtgggac 58920

tatgtcagct caccgcaacc tccatctcct ggattcaagc aattctcctg tctcagcctc 58980

ccaagtagct aggattacag gcgcccacca ccagacccag ctagttttta tatttttagt 59040

agagatggtg tttcaccatg ttggccaggc tggtctcaaa ctcctgacct caagtgatcc 59100

acctgcttca gcctcccaaa gtgctcagat tacaggcgtg agccaccgca ccccacctag 59160

atagaaattt caacatgagg ccgggcacaa tggctcacgc ctgtaatctc agcacttcag 59220

-continued

```
gaggctgagg cgtgggagga tcacttgggc ccaggagttc aggaccagca tgggtgacag  59280
agacagaccc tgtctctatt tatttgaaaa aaaaaaaaaa aaagagagag agaaagaaat  59340
ttcaacatga aaagtatctc tcaaaccctt cgagatgttg gcaaaaagcg actcaaagga  59400
aaatgtatta ctgtgtgtga atttgcttga aaataagaaa gaggccgggt gtggtggcta  59460
acacctgtaa tcccaacact ctgggagtcc gaatcaagtg gatcatgagg tcaggagatc  59520
gagaccatcc tggctaacat ggtgaaaccc tgtctctact aaaaatacaa aaaattagct  59580
aggcgcggtg gctcatgcct gtaatcccag cactttggga ggctgaggca ggtggatcac  59640
ctgaggtcag gggtttgaga ccagcctggc ctacatggtg aaacctcgtc tcttctacaa  59700
atacaaaaat tagctgggcg tggtggtggg tgcctgtaat cccagctact cagaggctga  59760
ggcaggagaa tcgcttgaac ccgggaggcg gaggttgcgg tgagccgaga tcgcaccact  59820
acactccagc ctgggcaaca gcctgggtga cacagtgaga ctccatctca aaaaatacaa  59880
aaaattagct gggtgtggtg gcctgcgcct gtagtcccag ctacccggga ggctgaggca  59940
ggagaatgga gtgaacctgg gaggaggagc ttgcagtgag ccgagatccc accactgcac  60000
tccagcctgg gcgacagagc aagactcttg tctcaaaaaa aagaaaaaaa aaggaaaaaa  60060
gaaccctgat aataaagaaa ccaaatgttc aactctcaaa gctcggacac tttaaagaaa  60120
taattaataa aggcagaagt taaagggagg atgataaagc aatttttttt gttggttttt  60180
ttgagatgga gtcttgctct gtcacccagg ctggagtgca gtgatgcgat cttggctcac  60240
tgcaacctct gcctcccggg ttcaagcaat tctcctgcct cagcctcctg agtagctggt  60300
actacaggtg cgcgccacct ggcccagcta atttttgtat ttttattaga gacggggttt  60360
caccatattt gttaggctgg tctcaaactc ctgatctcag gtaatctgcc cacctcggcc  60420
tctcaaagtg ctgggattac aggcaggcgc caccgcgcct ggcctaaagc aaaatattgg  60480
ttctgtgcaa aaggtcaata aaaagagcaa acgtttacaa actggagcca gcacccattc  60540
agctcagtgt gtctggagaa aaaacaatct cgcttcagaa ttcatgatta cgcagccctt  60600
tttgcttcct aaaaatccta ctatgttgct gttgaccatt ctctctcttt ctctctctct  60660
tgctttctct ccagaaaagc tattcagaca ttctcctctt tcctcaaacc tccaacactt  60720
cctcctccat ccttagcctc agctgctgac ctcacttcta atcattgaga aaccaggaga  60780
agcatttaag agtgaacctc cgcctccccg cacgggcaaa accacccacc cacagaattg  60840
tgccccaatt ctgcgtcctc tcctctcacc atggatggac ggtccaggct ccgagccaaa  60900
gccaggcctc ccctggagct ctggatccac cacctgcagc ttctcaggca gggccccagc  60960
agctcccctg ctcccttgta ccatcaatcc ctcccctcac tgggtcactc ccaacaatat  61020
atatatttag tgatgtttct cccatgtggt aaaatcactt agcctctctc ctcccccagc  61080
tactatccta tttgtttctt tccattctct gcaaaacttc tcaaagcatt gtgtctatgt  61140
gctgactcca tttatcttct cccgttctct gctgagtcct tcccacagac tctcacccca  61200
gttactccat gaaatgacct ctgcactgcc acatccaatg gtgaatgttc agttcttaat  61260
tttattcagt ctttcagcag catttgacct ggccgatcac tccctcttct taaaaatact  61320
tttctcagcc aggcgtgatg gctcacacct gtaatcccaa cactttggga ggccaaggcg  61380
ggaggatcat gagagcccag gagttcaaga tcagcctggg caacatggca agaccctatc  61440
tctacaaaaa ctaaaaagta gccagtgtga tggcatgcac ctgtagtccc atctacttag  61500
```

-continued

gaggctgagg cagtaggatg acttgagcct gggaaatcaa ggctgcagtg agccatgatt 61560

gcaccactgc actccagcct gagtgacagc gagaccctgt ctcaaaaaga caaaatagga 61620

aacttttctc agcatattcc tctgattctc ctgctgcttc tgtctgcaca gattcagtct 61680

cctttgccgg ttcttcctca tcctcctgat ctcttgacct tgaagtgccc cagagtacag 61740

tctttttttt ttttttgag acgcagtctc gtctgtcacc caagctggag tgcaatggcg 61800

aggtctcagc tcatgcaacc tctgcctcct gggttcaagc gattctcctg cctcagcctc 61860

ccaagtagcc aggactacag gcacatgcca ccatgcccag caaattgttg tatttttagt 61920

agagacaggg ttttactata ttggccacgc tggtctcaaa ctcctgaact cgtgaaccac 61980

ccgcctcggc ctcccaaagt gctgagatta caggcatgag ccaccacacc cggcccagag 62040

tacagtcttt agacggcctc tctacctata cttgctcccc tcataaactc ctcctgcctc 62100

atggctttaa ataccatcgg tagactgatg actcccatat ttctcttttt tttttggaga 62160

cggagtctcg ctcagtcccc caggctggag tgcagtggcg cgatctcggc tcactgcaag 62220

ctccacctgc caagttcaca ccattctcct acctcagcct ctccagtagc tgggactaca 62280

ggcacccgcc accacgcctg gctaattttt ttgtattttt agtagagatg gggtttcacc 62340

atgttagcca ggatggtctc gatctcctga cctcgtgatc cgcccatctc ggcctcccaa 62400

agtgctggga ttataggtgt gagccaccgt gcccagccga tgactcccat atttctatct 62460

cttgctgtgt gggagttctc ctcagaactc catactcata aatccaactc tcataaatag 62520

tatctcaaat gggcaatatg ctcaaaagtc aattcctact tttctcccta aacttgcttt 62580

cctgcagtct ccaccatctt aatgtccaat ctaacattag gaggcaaaaa ctttgaagtc 62640

attcttgact cttctctatt acacacccta tccaatcttt ctgcagatcc agtcgacccc 62700

caaatccagt tagctctcat catctccact gttaccccct ggtccaggcc atcttcctct 62760

ctcacctgaa tcactgcagc attctcctca ctggtctctt tggttctgtt ttcactccac 62820

cttagcatag tctccacaga gcagtcagag ggatcctttt aaagtgtaat tcccatcctg 62880

tccctgctct gctcaaaacc ctgtcgtgat tcccgtttta atctgtcaga ttaaaagcca 62940

gagtctttcc agtgacctac atgatctgcc tattatcacc tcccacttct ttccccttgc 63000

tcactccact ccagctctgc agctgtcctt tctgtttcct gaacagccca gattttgctt 63060

ctttagaacc tttgtatttg ctgtcccctc tgtctggaat gtttttccag gaagtcacct 63120

ggctctctcc tgcacttcct tcctgaccac catgtttaaa aatcactcaa acacacttca 63180

ggccggacat ggtggctcac gcctgtaatc ccagcacttt gggaggccaa ggtgggtgga 63240

tcacctgagg tcaggagttc gagaccagcc tggccaacat ggtgaaactt cgtctctact 63300

acaaatacaa atagtagcca ggtgtagtgg cacacacctg taatctcagc tactcaggag 63360

gctgaggcag gagaatcgct tgaacccaga aggcagagga ggtgcagtga gccaagatca 63420

cgccacaaca ccccagcctg ggtgacagag caagacccca tctcaaaaaa aaaaaaagaa 63480

aaaaaaatca cacaaacaca cttctcttca tattcctttt ccaagtttta tttttctcca 63540

gaatacttta cattgtttta atggaagttc tccgtttccc cccaactaga atggatactt 63600

cctgcaggta ggcactctag tcctcccatc caagtactaa ccaggctcaa ccctgcttag 63660

cttctgagag caggggagat caggcctgtt cagggtggta tggcccagga attttgattc 63720

tgttttattc attgctgttc tgttgattct cttttgttcc tcctcctagt gctgagaaca 63780

-continued

ctacttgtac ataataagca ttcaataaat atttgttgaa tgaatgactt gttgaatgaa 63840

ttaatctcag aaatgcagga ctggttctac attagaaaat ttttcaaggt cattctctgt 63900

tgtcgtaaca cattaagaga ggaaaatttt gtactctaaa tcatttgata aaatacatac 63960

tgatttctgt tttcaaaaac tcttagtggc tgggcgaggt ggctcacatc tataatccca 64020

gcattttggg aggacgaggt gggcggatca cttgaggtca ggagtttgag accagcctgg 64080

ccatcatggt gaaaccctat ctctactgaa aatagaaaaa ttagccgggt gtggtggcgc 64140

atgcctgtag tcccagctac ctgggaggct gaggcaggag aatggcttga acccgggagg 64200

cggaggttgc agtgagccaa gatcatgcca ttgcactcca gcctgggtaa cagagtgaga 64260

ctccatctca aaagaaaact cttagtgagt ttaggaatcc aaggaagacc ctcaaactaa 64320

atagataatc tagctaccag aagccttcag taaaccttaa cactccatgg tgaaacatta 64380

gaaacattcc tactaaaaga caggctaaga atgcctgcaa tcttcacggc tagtccaaga 64440

agtcaaaaag aagaaatgag cgctgattta aaaaaataaa caaacaaaaa actaccgatg 64500

cagaggctgg cagcaaggac tgaaggactg tacagtactt gcctggagca ggcggatggc 64560

cacacccctg cgaagcctgc tcagctggct gggggacgct ccagtgtgtg agtggcagga 64620

tgcagggtac ttcctctgcc agggagttgc actggggaga tcctccccca ctcacacttt 64680

ggcagctggg gctttggaat gtgacttagc ttctgtcaaa gggtcaatcc acccttttgat 64740

atatgatgca aaggcgaaca tatgatgcaa aggtgagaga acagcccaaa ttaggacttt 64800

taccacagct gtggaggtgg acagcgacag tggtgggccc tggccagact tttcatgctc 64860

aaaggtggtg gttgttcttc ctacttcttg tccctccagg gcttcctttg cctgtgtgct 64920

gaacctgctt cttttaattt tttttaactt ttttaaattt ttaattgttt taattaaaac 64980

aaattttgaa aactgtctga acctgctttt gaaccctgct atgatttgaa tgtttgtccc 65040

ctgccaaact gattttgaaa cttaatctcc aaagtggcaa tattgagatg gggctttaag 65100

cagtgactgg atcatgagag ctctgacctc atgagtggat taatggatta atgagttgtc 65160

atgggagtgg catcagtggc tttataagag gaagaattaa gacctgagct agcatggtcg 65220

ccccttcacc atttgatatc ttacactgcc taggggctct gcagagagtc cccaccaaca 65280

agaaggctct caccagatac agctcctcaa ccttgtactt ctcagcctct gtaactgtaa 65340

gaaataaatg ccttttcttt atgaattacc cagtttcaga tattctgtta taaacaatag 65400

aaaacgaact aaggcaaact ctcatgattc tactgccatg ccattccaat aaactccctt 65460

tatgcttaag agagccagag ttggccaggc gtggtgactc acgcctgtaa ttccagcact 65520

ttgggaggcc gaggcaggtg gatcacaagg tcaggagatc gagaccatcc tggctaacac 65580

ggtgaaaccc cgtctctact aaaaatacaa aaaaattagc tgggcgtggt agtgggtgcc 65640

tgtagtccca gctactcggg aggctgaagc aggaggagaa tggcgtggac ccaggaggcg 65700

gagcttgcag tgagtcgaga tcgtgccact gcactccagc ctgggtgaca gaatgagact 65760

ccgtctcaaa aaaaaagaga gccagagttt atttctgttg cttgcaacca agaaatctgg 65820

ctggtgcact gaagtttcca taaataatag caatttaaag actctttcca agccaggcaa 65880

tgcctagcct tgtgtagtcc ttgtggtaat acattcattc attcatttgt tcaaccaact 65940

gtgctccaga gactaagaat acaaaaatgg gggccgggtg tggtggctca cacctataat 66000

cctagcactt tgggaggccg aggcaggtag atcacctgag gtcaggagtt cgagaccaac 66060

-continued

ctggccaaaa tggtgaaacc cctactctac taaaaataca aaaaattagc tgggggtggt 66120

ggcggacacc tgtaatccca gctactcgtg agactgaggc aggagaatca cttgaacccg 66180

ggaggcagag gttgcagtga gccgagatcg caccactgca ctccagcctg ggcaacaaga 66240

gcgaaactcc acctcgaaaa aaaaaaaaaa aaaaaaagag ggccggggct gggcgcagtg 66300

gctcacgcct gtaatcccag cactctggga ggccaaggca ggagaattac gaggtcagca 66360

gatcgagacc agcctgacca acatggtgaa accccatctc tactaaaaat acaaaaatta 66420

tccgggcgtg gtggcgcaca cctctagtcc cagctacttg ggaggctgag gcaggagaat 66480

cgcttgaacc cgggaggcag aggttgcagt gagccgaaat catgccactg cactccagcc 66540

tgggtgacag agtgagactc cgtctcaaaa aaaaaataaa aaaaaaaaaa gaattcaaaa 66600

attgtagagt tatagtgtgc ttctagttta gttgagagga catctgtcct tcaaggaagg 66660

ctagaatcta taccctgagt ccttactgaa atcaatccag cagtcaaaac atgggaccaa 66720

cgatcacagc agtaagatag gaagagcacc tttgtacatt tagctcatgt tgagataagc 66780

cactgacaga gctgaaggaa gctcacagtt ctgggttcca tcctttggca tttaaaaaga 66840

aaagtgctaa gaaaattcgg ttggtcacgg tggctcacgc ctgtaatccc aacactttga 66900

gaggccaagg caggcagatc acgaggtcag gagttcgaaa ccagcctggc caacatggtg 66960

aaaccccgtc tctactaaaa acagaaaaat tagccgggca tggtggcgca tgcctataat 67020

cccagctact caggaggctg aggcaggaga attgcttgaa cccgggaggg ggaggttgca 67080

gcgagtgaga gcaggccact gcactccagc ctgggagaca gagcaagact ctgtctcaaa 67140

aaaaaaaaag aaaaaaagaa agaaaggaaa aaaagaaaga aaaaaaaaga aaaaagaaaa 67200

ttcaggccag gccaggcctg gtggctcaca cctgtaatcc caacactttg ggaggctgaa 67260

gcgagacggt gccttagccc aggagtttga gaccagcctg agcaacatag cgagaccctg 67320

tctctataaa aaaaaatttt tttttggcca gacgcagtgg ctcacgcctg taatcccagc 67380

actttgggag gccgaggcag gtggatcacg aggtcaggag atggagacca tcctggctaa 67440

cacggtgaaa ccccatctct actaaaaaat acaaaaaatt aaccgggcgt ggtggcgggc 67500

gcctgtagtc ccagctactc gggaggctga ggcaggagaa tggcgtgaac ccgggaggcg 67560

gagcttgcag tgagccgaga ttgcgccact gcactccaga ctgggagaga gtgagactcc 67620

gtctcaaaaa aaaaaaaaaa aaaaaaaaat taattgtcag gtgtgctggc atgcagctgt 67680

agtcctagct actcgggagg ctgaggtaag aagatcgctt gagcccagga gttcaaggct 67740

gcagtaatag tgcctctcac tctaccctgg gtgacaatga gaccctctct caaaaagaaa 67800

gaaaaaaggg aaagaagaaa agaaagaaag aaagagaaga aaggaaggaa gaaagaaaga 67860

aaaagaaaag gaaggaagga agaagaaaaa aaaagaaaga aagaaaagag agagaagttc 67920

aaagaccaaa gggtcaggat cccaaaatag tttttatgtt ttatttattt atttacttat 67980

ttatttttga gacagtatgg ctctgtcgcc caggctggag tgcagtgatg cgattgcggc 68040

tcactgcagc ctccaaactg ggctcaggtg gccctcccac ctcagcctcc cgagtagctg 68100

ggaccacagg cgcgtgccac catgcccagc taatttttta attctttgta gagatgaggt 68160

ctctatatgc tgcccaggct ggtctcgagc tcctgggctt aagccatcca cccgcctggg 68220

cctcccaaag tgctgggatt acagaagtga gccaccgcgc ctaatcgggt ggtttgtttg 68280

tttattgacg gggtctcgct gctgcccagg ctggagtgcc agtggctgtt cacaggtgca 68340

-continued

gtcctggagc attgcatcag ctcttgggct ctagcgatcc tccagagtag ctgcagctgg 68400

gattccaggc gcgccaccgc gcggggctca gaatgggttt ttatattgag ggttatgctg 68460

ccacctagag gatatatgta gtaccgaact gtgtgcgcag ggaggctgag gttgcagtga 68520

gccaagatga tgccagggca ctccagcgtg ggtgacagag caagatttca tctcaaaaaa 68580

aaaaaaaaaa aaaaaaaaaa aagaattgaa agtaaggtct tgaagagata tttgtgcctg 68640

tatggtcata gcagtattaa ctttgaccca ctagctaaaa cacaaaagca acatgtgtct 68700

gtcagcaggt gaacggataa acaaaatgtg gtatatatgt acaattgaat attattcagc 68760

ctttaaaaag gaataaaagg ctggatgcgg gggctcacgc ctgtaatcct aacactttgg 68820

gagactgagg tgggtggatc acccgaggtt aggagtttga gaacagcctg gccaacatgg 68880

tgaaacttca tctctactaa aaatactaaa attagccggg catggtggca cttgtctgta 68940

atccaagcta ctggggaggc taaggcagga gaattgcttg aactcaggag ccggaggttg 69000

cagtgagcta agatggcacc actgcactcc agcctgggca acagagtgag actccatctc 69060

aaaacaaaca aacaaaaaat tattatttcc aaagaaacaa gaccctgggt ccatttccca 69120

gcccacacct gatgttgact cacaacacac agcctggttt gctatgagcc tgcttcattt 69180

aattgtcacc ttaacttcac atcaccctca agtcctggaa taactctttg ctgacctttg 69240

tgtgctgagc catctccatg tcgctcaacg tgcagtccct ctcactgcac tgagtcaata 69300

gccagacgtg gtctgactgc agggtcatcc ttggtggctt aggctgactc gggcatagca 69360

gggtgctctg agacctcacc gcatataggc tttgccccca ataaactcta tataatattc 69420

atattatgtg gtctgggtgt gtgtagcttt gcactgtctt ctcgtgacag tgccctcaac 69480

ctctttccca ggatttcctc ctctacctcc tcaagtccca ctgctctgca aagaccaaaa 69540

gctgcagagt cccagctccc tcctttacac cccacgacgc agcctcctct ctcagaaccc 69600

tttaaacaga gtcttttact gcagatccca agaacagcca cacccctctc tcccacccac 69660

tccagacaca cccaggtaat tatagcaccc agggtaacta tgtagatgga gtccctggaa 69720

catgtggata gtgccccctg ggagtatgca aaagcaacat tgctggcacc tgcagagaac 69780

agggtgacat ccaggaatca gagcatgggc ctctgggagg tagggatgtg gccaggcagg 69840

ctgccaaaaa ttggtagagc aaggccacag gatctttctg accttcctte caaacagagg 69900

ctcctgtact ggtgatccct gtgttgattg accactccct tcctgggggt cgtggtctct 69960

gtcccagttg cccggacttc tgtgagtgtc ctactgaggt ccttttcatg agaagcatgc 70020

tgtccttcca cctgctggga gcaagagtga caacttcaat actataatag cagtggcata 70080

cagagaagaa gaaagatgaa gtggcaagaa aaacaggctt ccaagcagga gtttttctat 70140

aaaaacaaaa acgtttacaa gcaaactttt tataaagggc tagatagtaa atattttagg 70200

ctttgagagc cacatagact tgtttgcagg gactcaatgt cgctattgta gtttgaaagc 70260

agccatcagg gttatgtaaa tgagtgagtc tgattttgtt tcagcaaaat tttatttacc 70320

aaaacagaca atgagtgggc tggatttggc ccatgatcct tagtttgcca actcctgctt 70380

tgggctcacc cagatctgat tttgaattct ggctctgcta ctggttagct gcaggagctt 70440

ggaaggctct ctgagcctgt ttcctcatct gtaaaattaa agcaataatt tctaacactc 70500

aagagtgtta cctcacgcct gtaatcccag cactttggag gctgaggcag gcggatcacc 70560

tgaggtcaga agttcaagac cagcgtggcc aacgtggcaa aaccctgtct ctactaaaaa 70620

-continued

atacaaaaag tagccgggca tggtggcgcg catctgtaat cccagctact tgggaggctg 70680

aggcagggat actgctagaa cctgggaggt ggagcgtgca gtgagtggag atcacacctc 70740

cacactccag cctggccgac agagcgagac tccatctcaa aaaaaaaaaa aaaaagagtg 70800

ttagaaggtt ttgagataat gaataaaaga tgccttgtgt atactaagta ttcaacaact 70860

gatagctgca ttggtctaat tataacagtt tagaagcgat tgagtcaaca aatgctggat 70920

ttgtcaggga ggacttccta tcaggaggta gatcttgggc tgagtcctga agcaaagata 70980

ggcattggat agaggagttg agagaacacc ctaggactgt tattattatt attcgacacg 71040

gagtctcttg ctctgtcacc caggctggag tgcagtggcg cgatctcggc tcactgcaac 71100

ctctgcctcc caggttcaag cgattctcct gcctcctaag tagctgagac tacaggtgtg 71160

tgccaccaca cccggctaat ttttatattt ttagtagaga cagagtttca ccatgttggc 71220

catgctggtc tcgaactcct gacttcaggt gatccacccg cctcagcctc ccaaagtgct 71280

ggaataacag atgtgagcca ccgcacccag cccagaacca tttttcaatc cttggctctg 71340

ccttttatta gctgcaagat ctcaggcaat ttatttaacc tctccaaaga ctcattttct 71400

cattcacaaa atgaggcaaa taataatatc tactatccca ggttgtcatg agaattaaat 71460

gcaacatgac atttaatgaa atgagaagtc ccttggacat taactggcta aagtatgtgc 71520

tcgacaagga tatcatttta ggtggatact tagcatctca gaactgatgc tcacaatgga 71580

atatcattga aacgcattaa aattcatttt aaatgattgt aggtagtgag gcaattgaaa 71640

gaagaagaca agaggactga ttataatgct tcaggctcac tagtctcctt ttaggaggga 71700

aaaacaattt caagttaaat tttaggctct agatttttac ccctgctgct cattagaatc 71760

acccagattg atgaaatcag agcccatctg aggctgtgtt tttcatctcc agaatgagag 71820

ctgttgtggg gattaagttt ttgaaaaagt acatctaaca ggtgatcgaa aatgatagtg 71880

atattattgc agtgatggtc attattgttg ttattattat actgaaagag gcttcagttt 71940

tctgatccat aaagtgaggg aattgcatga gaccattgct aagattcctt ctagctctgt 72000

ttttttgttt ttgtttttta gacagagtct ctgtcgccca ggctggagtg caatggcatg 72060

atcttggctc actgcaacct ccgcctcccg ggttcaaatg atcctcctgt ctcagcctcc 72120

gaagtagctg ggactacagg cacacaccac catgcccagc taacttttat atttttaata 72180

gaggtggggt ttcaccatat tggtcaggct ggtctcaaac tcctgacctc aggtgatcca 72240

cccgcctcgg cctcccaaca tgctgggatt acaggcatga gccactgtgc ccaacccctt 72300

ctagctttct tgatcactga ttctagggtt ctctgctgaa atatatttga gacatcctgg 72360

ataaaagatc atgcaagagc tcccaatatg gtattaataa ttgattctgg aggcttagct 72420

actcctgatg gattagacat gactcaactg cctctcttat gtgtacaaca caacaacaca 72480

accaagaaag gttattctgg cattccattt attcagttta tttacagccc ttacttccag 72540

cagcacgtta aagatatggc cagggccggg tgcagtggct caagtctgta atcccaggac 72600

tttgggaggc caaggtgggc ggatcacaag gtcaggagtt tgagaatctg gcaattcttc 72660

agacttagaa gcaaccagct cgataacaca gtcttgtgtg ggctctccct ctgtccctcc 72720

ctcgcttccc tcatttctca tccctgcccc tgagactgtg caccttcaca tagccctgcc 72780

atgagacctt catctcaggc tttgctttct ggggtaactg aggctaaaca ctgagtggcc 72840

ctaaaagagg attgggattt ggaagttaga ttattcacca gagaacagac tttgctgatg 72900

-continued

atcaggccca ggttgtaatt gttgaaaaaa agagaggatg catagtctta tctcatctcc 72960

tagtcaaagt caacaccatg ataaataaga gtcaaatcct gagatgtgaa ttggggacat 73020

ttgagtggtt aaccctgaga agcttgcacc ttcagacccc tcaatacccc tgctccccag 73080

agaaggctgg acattgacct cagcacaggc aggagccctg caagatgcca tttgtcctac 73140

taaagatgga cccctccact ctgtttctag gtaaataacc aaagtcaagt ctccacacag 73200

cctgagcaag aaagtcagag cctgctacag gagaaaatac cacactggcc aaaggattca 73260

ctagccctgg ccactgtgtg tgggaggaac cagggaatca tgtgtgggag tcaatgttga 73320

agctgttgga ctgggggtgg ggtggaatat aagcctggcc ctggggagtt tttcccgttt 73380

gagggccttt acccacaact caagatccag tgctatagca ggagatccca gagctagtcc 73440

taacagatgg tcaggattga acttggccta gagtaaaatg aggaggatag tgccagaact 73500

ttctcaacat actattgagg aagaggtcag aaggcttaag gaggtagtgt aactggaaag 73560

gggtcctgat ccagacccca ggagagggtt cttggacctt gcataagaaa gagttcgaga 73620

cgagtccacc cagtaaagtg aaagcaattt tattaaagaa gaaacagaaa aatggctact 73680

ccatagagca gcgacatggg ctgcttaact gagtgttctt atgattattt cttgattcta 73740

tgctaaacaa agggtggatt atttgtgagg tttccaggaa aggggcaggg atttcccaga 73800

actgatggat ccccccactt ttagaccata tagagtaact tcctgacgtt gccatggcgt 73860

ttgtaaactg tcatggccct ggagggaatg tcttttagca tgttaatgta ttataatgtg 73920

tataatgagc agtgaggacg gccagaggtc gctttcatca ccatcttggt tttggtgggt 73980

tttggccggc ttctttatca catcctgttt tatgagcagg gtctttatga cctataactt 74040

ctcctgccga cctcctatct cctcctgtga ctaagaatgc agcctagcag gtctcagcct 74100

cattttacca tggagtcgct ctgattccaa tgcctctgac agcaggaatg ttggaattga 74160

attactatgc aagacctgag aagccattgg aggacacagc cttcattagg acactggcat 74220

ctgtgacagg ctgggtggtg gtaattgtct gttggccagt gtggactgtg ggagatgcta 74280

ctactgtaag atatgacaag gtttctcttc aaacaggctg atccgcttct tattctctaa 74340

ttccaagtac cacccccccgc ctttcttctc cttttccttc tttctgattt tactacatgc 74400

ccaggcatgc tacggcccca gctcacattc ctttccttat ttaaaaatgg actggggctg 74460

ggcgcggtgg ctcatgcctg taatcccagc actttgggag gccgaggcgg gcggatcatg 74520

aggtcaggag atcgagacca tcctggctaa cacggtgaaa ccccgtctct actaaaaatg 74580

caaaaacatt agccaggcgt ggttgcaggt gcctgcagtc ccagcggctc aggaggctga 74640

ggcaggagaa tggcgtgaac ctgggaggtg gaggttgcaa tgagccgaga ttgtgccact 74700

gcactccagc ctgggtgaca gagcgagact ccgtctcaaa aaaaaaaaaa aaaaaaaaaa 74760

tagctgggca tggtggcgcg tgcctgtaat accagctact ctggaggctg aggcaagaga 74820

atcgcttgaa cccagtaggc ggaagttgca gtgagccgag atcttgacac tgcactccag 74880

cctggtgaca gagtgagact ctgtctcaaa aaaaaaaaaa agaaaaaaaa agacagaaag 74940

aaagagcaca gacagagtca caggtatttg cagtaggaag ctgtcaggtt agagtgcacg 75000

gaaatagaaa gtatatttta cacttacagc acatcttcgt ttgattagcc acatttaaaa 75060

tactgaatag caacgtgtgg ctatttagta ttcactaaaa tcttggacag tgcaagtcta 75120

aagaatcctt gatccgtccg gcatggtggc tcacgccttt aatcccagca ctttgggagg 75180

-continued

ccaaggtgga aggatcactt aaggtcagga gttcgagacc agcctggcca acatggtgaa 75240

acctcgtctc tactaataat acaaaaaaaa ttagccgggc atggtggtgc atgcctgtaa 75300

tcccaggtac ttgggaggct gaggcaggag aatagcttga atccaggagg cgctgcagtg 75360

agccgagatc atgccatgcc actactgcac tccagcctgg gcaacagagt gagactgtct 75420

caaaaaaaaa aaaaaaattg ttgggcgtgg tggctcacgc ctgtaatccc agcactttgg 75480

gaggctgagg ggggtggatc acctgggttc tggagttcga gaccagcctg gccaacatgg 75540

tgaaacccca tctctactaa aaatacaaaa attagctggg cgtggtggtg ggcacctgaa 75600

atctcagcta ctcaggaggc tgaggcagga gaatttcttg aacccaggag gcagaggttg 75660

cagtgagcca agatcgcgcc tctgcactcc atcctgggtg gcagagcaag actatgtctc 75720

aaaaaaaaaa aaaaaaatac ttgattgtct ggacattctg cagaacatca tatggagaca 75780

ctatgttgac gacatcatgc tgattgtaag caagaaatgg caagtgttcc agaaacacag 75840

tcaagacaca tacatgccag aaggtgagat ataaactcta ctaagattca gtggcctgcc 75900

acactggtga catttttaaa cctgctagat gtttgtgtag aaaaggattt aaccttgccc 75960

aaagaggggt ctggcctttg tccccagcta ctggacataa tctctttaaa ctcttgaaat 76020

atcattcctg atagaagtat ttttgttttg actaggggcc ttgggccagc cagatagcaa 76080

caatgtgatc tgggttgggg gctttggatc aggtggcatc agtgtgacct cctgagtggc 76140

tagagactag aatcaaccac atgggcagac aacccagctt acatgatgga attccaataa 76200

agactttgga cacaagggct tgggtaagct ttcctggttg gcaatgctct atactgggaa 76260

acccattctg actccatagg gagaggacaa ctggatattc tcatttggta cctccctggg 76320

ctttgcccta tgcatttttc ccttgtctga ttattattat tattatgaga tggaatctcg 76380

ctctgtcacc caggctggag tgcagtggaa tgatctcaac tcactgcaac ctctgcctcc 76440

ccggttcaag cgattttcct gtctcggcct cccgagtagc tgggactaca gatgcatacc 76500

accacacccg gctaattttt ttgtattttt agtagagacg gggtttcacg ttagccagga 76560

tggtctcgat ctcctgacct catgttccgc ctgcctcggc ctctcaaagt gctaggaata 76620

catgtgtgag ccaccgcgcc cagccccctt ggctgattat taaagtgtat ccttgagctg 76680

tagtaaatta taaccgtgaa tataacagct tttagtgagt tttgtgagca cttctagcaa 76740

attatcaaac ctaaggatag ccttggggac ccctgaactt gcagttggtg tcagaaataa 76800

gggtgctcat gtgtgtacca tgccctctaa ttttgtagtt aattaacttt cacaacttta 76860

ttattaccgc ttacactcaa tgtttattca catttatcca cataccactt attctagtgc 76920

cttgcatcaa agactttcta tctcatgtac tttattctgc ttgaagtaaa tcctttagga 76980

tattcttttt ttttttaaa ctttgcacat acatactttt atttttatt tatttttaat 77040

tttgttattt ttgtgggtac gtagtagata tatgtattta tggagtacat gagatgtttt 77100

gatacaggca tgcaatgtga aataagcaca tcatggagaa tggggtatcc atcctctcaa 77160

gcaatttatc cttcaagtta caaacaatcc aattacactc tttaagttat tttaaaatgt 77220

acatttaatt ttgtattgac tagagtcact ctgttgtgct atcaaatata attttttttt 77280

tttttgagac agagtctcac tcagtggccc agactgaaag tgcagtggca caagctcggc 77340

tcacttcaat ctctgcctcc ctggttcaag cgaatctcct gcctcagcct cccacatagc 77400

tgggattaca ggcacacacc accatgccca gctaattttt atatttttt agtagagacg 77460

-continued

ggttttcgcc atgttggcca ggctggtctt gaactcctgg cctcaaatga tctgaccacc 77520

tcagcctccc aaagtgctag gattacaggc atgagccacc acacctggcc aaaatagaat 77580

attctttagt gaggtctgct ggtgacaatt ttttctttt ttttgagact gagtctcgct 77640

gttgtcagct tgggctggag tgcaatagca cgatctcagc tcactgcaac ctccacctcc 77700

cggattccag caattctcct gcctcagcct cccaagtagc tgagagatta caggcaccca 77760

ccaccacacg cggctaattt ttgtattttt agtagaaatg ggggttcacc gtgttggcca 77820

ggctggtctc gaactcctga cctcaggtga tccacccacc ttggcctccc aaagtgctgg 77880

gattacaagc atgagccacc acgcacagcc aatttttcc gtttttgtct gaaatcttat 77940

tttgtgtcat ctttgaaata tatttttgat ggatataaaa ttgttggttg atagttatta 78000

tcattattat tattattttg agacagggtc tcactctgtt gcctatgctg gggtgtagta 78060

atgtgatctc ggttcactgc agacttgacc tcctagggct caggtgatct tcccacctca 78120

gcctccctag tagctgggac tacagatgca tgccaccata cccaactaat ttttctattt 78180

tttgtagaga tgaggctttg ccacatttcc caggctggtc tctaactcct gagctctagc 78240

aatccaccca ccttggcctt acaaagtgct gggccatgac tagccagcag ttacttttta 78300

tagcatattg aatatttaat atgaatcttc tggcatccac tgtaactgtt taaaaaatca 78360

gctgtttact tggcactctt ttttttttt ttttttttga gacagagtct tgccctgtcg 78420

cccaggctgg agtgcagtgg cgtgatcttg gctcactgca agctctgcct cccgggttca 78480

cgccattctc ctgcctcagc ctccggagta gctgggacta aaggcgcccg ccaccacgcc 78540

cggctgattt ttttgtattt ttcgtagagt tggggtttca ccgtgttagc caggatggtc 78600

tcgatctcct gacctcgtga tctgtccgcc tcggcctccc aaagtgctgg gattataggc 78660

gtgagccacc gcgcccagcc tctttttttt ttttttttag acggagtctt actctgtcat 78720

ctaggctggt gtacagtggc gtgatctcag ctcagtgcaa cctccacctc ctgcctcagc 78780

ctgccaaata gctgggatta caggtgcgta ccatcacgcc cggctaattt ttgtattttc 78840

agtagagatg gggtttcacc atgttagaca ggctggtctc gaactcctgg cctcaagtga 78900

tctgcctgcc ccagcctccc aaagattaca ggcatgagcc accgcacccg gccaagtagc 78960

actcctttga aggtaatctg cttcccctac ccctagcaat ttttaacaat ttttcttcat 79020

ttttatttcc tgaagttttg ttattaataa tctgtgtgca gatttctttg tatttctttt 79080

gtttgcagtt catagtgatt cttgaattag tgtgttggtt tctgttatca ccacaggaaa 79140

attgtcagcc gttagctttt caaatatttc cttgctaaat tctctcttct ccccttccgg 79200

tacaattgat ttgattaaaa ctaaaaccag ggccgggtgc agtgactcat gcctgtaatc 79260

ccaacacttt gagaggctga ggcaggtgga tcacctaagc tcaggagttc aagaccagcc 79320

tggccaatat ggtgaaaccc cgtctctact aaaaatacaa aaattaccag gcatggtggc 79380

acacatttgt agtcaggagg ctgaggcagg agaattgctt gaatccagga ggtggaggtt 79440

gcagtgagct gagatcccac cactgcagtc tggcctgggc gacagagtga gatgagaatc 79500

tgtctcgaaa aaaaaagtta tgaatgtttg ataaactata tttgttagaa tgtttgttgt 79560

agaatactat tcattgattt ttaaacaatg ttagattaaa ccattcactg gatttgtgat 79620

aattaactta ctgattttac ctcactgatt tgttgtaatt aatacaactg gtataaaaag 79680

actgtgacga ggccgggcat ggtggctccc gcctataatc ccagcacttt gggaggctga 79740

-continued

```
ggcaggcgga tcacctgagg tcaggagttc aagaccagcc tgaccaacat ggtgaaaccc  79800
catctttact aaaaatacaa aattagccgg tcgtggtggt gcatgcctgt aatcccagct  79860
cttcgggagg ctgtggcagg agaatcactt gaacccggga ggtggaggtt gcagtgagcc  79920
gatatcgcgc cattgcactc cagcctgggc aacaagagcg aaactccgtc taaaaaaaaa  79980
aaagaaaaaa aacacataaa acaaaacaac actgtgacgg ttcccaaaaa ttaggagcat  80040
aattaaagga actcctgata aaaattaatt ttatcttaca tgtaaactaa aatgacttta  80100
tgaagttaat tcagaaatac aatgcagggt attagtttgc cacagctgcg tattcagcct  80160
aatgtaatat tcttgttatt tttaaattct tcttttaact ttactcatat gtggatcatc  80220
aaatttcaaa agattaaatg acaatactct tagcagcaag cttccctaag catataaaca  80280
ttttaatggg tgatgattca gaaggtaccc gaagaatatg tactgccaga tatcattcac  80340
ccccatatac ctgcccgaca gacatcccat tttgggaccc tggataaatg tgtgggtgga  80400
gagaaagata ggagaaagtg gtataagcaa atggctttgg agtctgattg acagcgattg  80460
aaatcctgtc tctacctctt aacagcctca tgatcctaca taagttaccc cgatcctcag  80520
ggccacatct gtaaattggg ggttgcgatg gcagccatct cacagggtct cttttcgggg  80580
aagggcagga attatggatt aagtgagcta gtaattgtaa agcacttaat acaaggaggg  80640
cgcataataa gtacttcata aataatgacg gccattatca tgactgaggt gtatgcagct  80700
gtcggggatt acggcgactt cagaatttct ggtgggcagg gctcaaaggc agcaaatcac  80760
actggaagtc gaggtgaggc actgcttctg cacagactgc ttagctggag agaatgagga  80820
aggcttagag gagatttaga ggaacttaga gtcctccgcc tccaactctg tgggatctgc  80880
tcccgtgcca gagacattca ggggatttct cgcactctcc cctcccctac gtcctcccg  80940
ccccatccaa ctaaccacac aacacataca aaatagcccc tgcgaggttc tgcacgctgg  81000
aagggaacag gagaagggcg ctgcgctttc ttgctgatgc cctgtacttg ggcccctggt  81060
agacacagcc acttgtcccc tcagcctgca gagaaatccc acgtagaccg cgcccgggtc  81120
cttggcttca gccaatctcc ctttggtggg ggtgggatgc acgatccaag gttttattgg  81180
ctacagacag cggggtgtgg tccgccaaga acacagattg gctcccgagg gcatctcgga  81240
tccctggtgg ggcgccgctc agcctcccgg tgcaggcccg gccgaggcca ggaggaagcg  81300
gccagaccgc gtccattcgg cgccagctca ctccggacgt ccggagcctc tgccagcgct  81360
gcttccgtcc agtgcgcctg gacgcgctgt ccttaactgg agaaaggctt caccttgaaa  81420
tccaggcttc atccctagtt agcgtgtgac cttgagcagt tgactttatt tttcagtgcc  81480
tagttttcca gataccagga ctgactccaa ggactattac tcatctggag ggtttagcac  81540
agtaccgtcg catagtaaat ttccatgtca gttttggtta cctttcatgc acttgcaaac  81600
atgccatgct ctgaaacgaa ataggcacat ctttttttct ttttttttta aggagtcttc  81660
ctctcgccca ggctggagtg cagtggcgcg atcttggctc actgcaacct ccacctcccg  81720
tgttcgagat tctcctgcct cagcctcctg attagctggg actacaggca tgccacgacg  81780
cccagttaat ttttgtattt ttagtagaga cggggtttcg ccatcttggc caggctggtc  81840
taactcctga cctcaggtga tctgactgcc tcagcctctc aaagtgttgg gattacaggc  81900
ataagccact gcatctggcc agaaatgaaa taagtaaatc ttttaacctg ctctaacaat  81960
atagtgaaaa gaccatatta ttattagagc aggttaaggg atttgcctat ttcgggttct  82020
```

-continued

agttatagtc ttaaacttgg acattcttgt agaaagtaaa aagtttcctc ttcaaagttc 82080

ccottcttgt taaagaatac atcataagtg ttagaagtaa tagtttattt taaagactaa 82140

ctttcttcaa gcctccttgc tttgtgctaa taactctttg ttaagcccta tcctatgtaa 82200

ctgttggaca tgctcacagg cacgttccag ttcacagcct atgcccottc cttatttgga 82260

aatgttattg cttccttaaa cctttcggta agcaacttcc tctccttctt cgttcttcct 82320

tgcacttacc tatttagaaa gttttaggct attagcaaat cggctatcag tttaagagtg 82380

tgaggtcccg ctccagccaa tggatgcagg acatagcagt gaggacgacc caaatgcgta 82440

agggataaat atgtttgctt ttcctttgtt caggtgtgct ctcgacatcg ttccatctgc 82500

gattgagcac cctttctgca gaaagtaaag attgccttgc tggagatctt ttgtctccgt 82560

gctgactttt cttcgtggca ccgattatct atttctaaca attttggtat ttctaacatt 82620

ctgaacaatc ttgggctagt tgtctcttct gggcctgttt ccccatccgt cacatgataa 82680

acttcattgg tttaaaaacc ccagcgaaca tttattgagt tactattacc ttcctgcoct 82740

ccccaacccc aaccccaggg agcagttaca acctcagccg ctgagcgcac tcgccgggtg 82800

ttaagaagca ccaaagacag ggaggcttga ttgattttgc tttgggagta gagggtcaga 82860

agattcacag gaaaatggca tttgagcaag gatgattcac tggagctagc ttttaaatac 82920

tggcgaggct tttatgttgc agtcccttac aaagttgagc attcgcaggg actgcactcc 82980

gaaataagcc cgcttcccct tttcattcgc taatgatcca gggagctgct ggttccgcat 83040

gcggcaggtt gtgccttttc ctaatcaggg ttctgcatcg cctcgaaccc gcaggccgtg 83100

gcgggttctc ctgaggaagc agggactggg gtgcagggtg aagctgctcg tgccggccag 83160

cgcctgtgag caaaactcaa acggaggagc aggaggggtc gagctggagc gtggcagggt 83220

tgaccctgcc ttttagaagg gcacaatttg aagggtaccc aggggccgga agccggggac 83280

ctaaggcccg ccccgttcca gctgctggga gggctcccgc cccagggagt tagttttgca 83340

gagactgggt ctgcagcgct ccaccggggg ccggcgacag acgccacaaa acagctgcag 83400

gaacggtggc tcgctccagg cacccagggc ccgggaaaga ggcgcgggta gcacgcgcgg 83460

gtcacgtggg cgatgcgggc gtgcgccoct gcacccgcgg gaggggggatg gggaaaaggg 83520

gcggggccgg cgcttgacct cccgtgaagc ctagcgcggg gaaggaccgg aactccgggc 83580

gggcggcttg ttgataatat ggcggctgga gctgcctggg catcccgagg aggcggtggg 83640

gcccactccc ggaagaaggg tcccttttcg cgctagtgca gcggcccctc tggacccgga 83700

agtccgggcc ggttgctgaa tgaggggagc cgggccctcc ccgcgccagt ccccccgcac 83760

cctccgtccc gacccgggcc ccgccatgtc cttcttccgg cggaaaggta gctgaggggg 83820

cgccggcggg gagtcaggcc gggcctcagg ggcggcggtg gggcaggtgg gcctgcgagg 83880

gctttcccca aggcggcagc aaggccttca gcgagcctcg acctcggcgc agatgccccc 83940

tgagtgcctt gctctgctcc gggactcttc tgggagggag aaggtggcct tcttgcgcga 84000

ggtcagagga gtattgtcgc gctggttcag aagcgattgc taaagcccat agaagttcct 84060

gcctgtttgg ttaagaacag ttcttaggtg ggggttagtt tttttgtgtt tctttgagga 84120

ccgtggatca agatcaagga aatctcttta gaaccttatt atggaagtct gaagtttcca 84180

aatgttgagg gttttatgtc taaaagcaac acgtgaaaaa attgttttct tcacccagtg 84240

ctgtcttcca atttcctctt tgggggggagg ggtagttact gctgttacta aaataaaatt 84300

-continued

acttattgct aaagttcccc aacaggaaga ccactacttt tgatgacttt ggcaagtttg 84360

ctaactactg gaaccctaac ttacaaacga actacttaca tttttgattt ccagttgtat 84420

tacctgccca atgtttacgt agaaacagct taattttgat tctgggtaac gttgttgcac 84480

ttcattaaaa atacatatcc gaagtgagca agtatgggtc tgtggacagc agtgattttt 84540

cctgtcaatt cctgttgctt cagataaaat gtaccagaca gaggccgggc gcggtggctc 84600

acgcctgtaa tcccagcact ttgggaggct tggcgggtgg atcacctgag atcgggagtt 84660

caagaccagc ctgaccaaca tggagaaacc ccgtgtctac taaaaatacа aaattagcca 84720

gggtggtggc gcatgcctgt aatgccagct acttgggagg ctgaagcagg agaatcgctt 84780

gaacctggga ggcggaggtt gcggtgagcc gagatagcac cattgcactc cagcctgggc 84840

aaaaagagcg aaactccgtc tcaaaaaaaa agtaccagac agaaatgggt tttgttttct 84900

ttttttgttt tgagacggag tttcgctctt gttgcccagg ctcgagtgca atggcgcgat 84960

ctcagtctcg gctcactgca acctctgtct cccaggttta atcgattctc ctgcctcagc 85020

ctcccaagta gctgggatta cccatgcccc accatgcccg gctaattttt gtatttttag 85080

tagaaacggg gcttcaccat gttaggctgg tcttgaaccc ctgacctcaa gtgggcctcc 85140

cacctcggcc tcccaaagtg ccaggattac aggcatgagc caccgcggcc agccagaaat 85200

gggttttgga aaaagcacta aacaaaatcg aacttggttt catatgacag ctctgctgct 85260

aactgtaaca ggggcagacc agttaaccta cttttctgtc ttctgtcagc tgagaattag 85320

atgattccca aaggcccatt gaactctgaa tgactttaaa tacttcttct taagtgggta 85380

cacggttttg gtaactgatg ccaggtgatg aatgcatgaa agtgcttaat gaatgaaacc 85440

ggtaaaatag taggaggaag ctttattggt aaggcagggg tatacctaat agctctctaa 85500

tttattggta ttgaagtggt taacttttgt ttttttaagg ggggaaaaca ttctaagaat 85560

aatgaggcaa actgcatatt gcacaagaga ctgttgtctc tattcaacaa atacctttтg 85620

agtgtccaga gtctgccagg tgctgtgcta ggccctcacg attgagtagt gaaccagaga 85680

atgtccctgc acccatggag cttattgtct actggggtag acagataata aataagcaaa 85740

caaatcttct ctcttctccc tttcgctcca tgtaagtgtg tgtgtatagg tgtatactta 85800

caagttgagt aaagtgttat gaaagattaa gaggagaaat gcattttggt tagatgttag 85860

aggactcagc aggtgacctt gaaacttaga gctgaaggat cagtaggagg taactagaga 85920

ggccagggaa tcgcatgttc aaaggccagg aggcaagaaa gagcatggtg cccttcaaga 85980

gaggaaagaa ggctactgtg actggagcat agatgtaggc aagtgttggg tgattgagag 86040

ctctacgggc catggttagg ttttattcct aatgccgaga tgccaaacat ggtggttcat 86100

atctgtaatc ccagtatttt aggaggccga ggcaggaata tagcttgaac ccaggagttc 86160

aagaccagcc tgagcaacat gagacctgta caaaacattt aaaaaattgc tgggtatgat 86220

ggtgcacacc tgtggtccca gctactcagg aggctgaggc agaaggatca cttgagccta 86280

ggaggtggag gctacaatga gccatatttg agtcactaca ctccagcctg gatgacaaag 86340

tgagaccatg tgtcaaacaa aatacagaaa gaatattaat ttaaaatttt gaaagaggag 86400

tgatctgaac ttatatctta aaaagatcat tctagggcat ggtggctcat gcctgtaatc 86460

aagggctttg ggaggctgag acaggaggat cacctgaggc cagttcgaga tcaacctgta 86520

cagcatagag agactccatc tctacaaaaa gaaaaaataa atagctgggt gttgtgagtt 86580

-continued

attcaggagg ctgaagcaga aagatcactt gagcccagga gtttgaggct gcagtaagct 86640

atgatcccac cactgcaaca cagtgagatc ttgtctcaaa aaaaaaaaaa aatcattcta 86700

ggtgcttttt ggaggctgga tgtggtaaga gtagaagctg gagatggtcc tgttagggat 86760

tcgattcaga ctttaaatac catcaatgca ttgagtccca aatttacatc actacgttgg 86820

atccttgccc ctgaatccag actggtatat ccaactttag gttcagtttg tatctctacc 86880

tgaccaatat agaggtgtcc agtcttttgg cttccctagg ccacattgga agaagaattg 86940

tcttgagcca cacatagagt acactaacgc taacaatagc agatgagcta aaaaaaaatc 87000

gcaaaactta taatgtttta agaaagttta cgaatttgtg ttgggcacat tcagagccat 87060

cctgggccgc gggatggaca agcttaatcc agtagatacc ttcaacttac aatatctaaa 87120

attttatgcc agatttagtc attttaaacc tgctcatcag tttttctcaa gaagtagtat 87180

tttggctttt tttcttttct ttttttgag atggagtttc gctcttatcg ttcaagctgg 87240

agtgcagtgg cggatcttgg ctcactgcaa cctccgcctc ctgggttcaa gtgattctcc 87300

tgcctcagcc tcgcaagtag ctggaattac aggcatgcgc caccatgacc agctaatttt 87360

tggagacagg gtttcaccat gttggtcagg ctggttttgt actcctgacc tcaggtgatc 87420

tgcctgcctc ggcctcccaa aggctgggat tacaggcatg agccaccgct cccggctgca 87480

tttttggatt tttagttgct cagcccaaaa ctttagtaca tctttgaacc tcttctttcc 87540

tcctactcta tatctgatcc atcagcaaat ctgttaggtc tacctcacac atatcgaaat 87600

cctaccacgt ctcaccatct gtgacaatta acaccctggt ctaggcagtc atctctgtta 87660

agattgagtg gttaaggatg tcctctaagg agatgacatt caaatcttag cttaaatgtc 87720

aagagggagc tggttttata aagattgagg aggcagcatt attttgccat aggcttccat 87780

ttggtttcca ttccattctt gatacttatg gtatatattc aaaacaaatg cacagaaaca 87840

gacccaggta tattgggaat ttcggatata gagttcctag ttgggaaaag atagactgat 87900

ctgtaaatga tgctagttat ccatcatctg gcaaaaaata atttcctgcc tcctctcata 87960

tatctcagat caacagactt tttctgttaa gggccaaatc ataaatattt taggctttcc 88020

agaccatatg gtttctgtca cactctcctt tatccttgaa gccatagaca atatgtaaac 88080

aaatgggcat ggctgtgcta cgataaaact ttacttacaa aaactggtag tgggccagtt 88140

taggcatggc cagcactttg ggaggctaag gcagatggat cacttggggt caggagtttg 88200

agaccagcct ggccaacatg gtgaaaccct gtctctacta aaaatacaaa aaatagctgg 88260

gcatggtggt gggtgtctat aattccagct actctggagg ctaagacaca agaatcactt 88320

gaacccagga ggcagaggtt gcagtgagct gagatagcac cactgcactc cagccagggt 88380

gacggagtct taaagcaaaa caaaacaaaa ggtagtgggt tgtatttggc ccatgggctg 88440

tagtttgcca atccctgatg cagaaacaaa ttccaggtaa ataagagcct ggaatgttaa 88500

aaaaacaaaa cttgaagtca tgtagaagaa caggtagggg gaacaatcct gatctcagga 88560

taggaaggga tattgcttaa aataagacac aggaaaatat aatccatgtt gtgtaaattt 88620

gactacgtta aaacttaaaa ctttcgccaa gcgcggtggc tcacgcctgt aataccagta 88680

ctttgggagg ccgaggtgag cagatcacca ggtcaggaga ttgagaccat cctggctaac 88740

acggtgaaac cccgtctcta ctaaaaatac aaaacattag ccgggcgtgg tggcgggcgc 88800

ctgtagtccc agctacttgg gaggctgagg caggagaatg gcctgaaccc gggaggcgaa 88860

-continued

gcttgcagtg agctgagatc gcgccactgc actccagcct gggcgacaga gtgagattcc 88920

gtctcaaaaa aacaaaacaa aacaaagcaa aaaacctaaa actttcatac aataaagtat 88980

acctaagata cttctagaag agaagattta catccaggac gtgtatggaa tttctgcaag 89040

taataagtaa aagacaaggg acatgaagag gcagttcaca aaagaggaag ccaaaatgac 89100

caataaacat gaaaggatgt ttaacctcaa aggaaacaag gaaatgaatt aaaaacatca 89160

aatgccattt caaaactagt aagttggcaa aattaaaaat accaaggatg agaatatgaa 89220

gcatggctat atgagtgcat ggaatggtac agtcactttc attaaaaatg cacataattt 89280

gtttttatt tatttttttg agacagtcta tgtcgcccag gctagaatgc agtggcatga 89340

tctcggctca ccacaatctc tgcctcctgg gttcaagcaa ttctcctgcc tcagcctcct 89400

gagtagctgg gattacaggc acatgccaca acgcccggtt aagttttgta tttttagtag 89460

agacagggtt ttgccatgtt ggccaggctg gtctcgaact cctgacctca ggtgagctgc 89520

ttcccaaagt gctgggatta gaggcgtgag ccaatgctcc tggctgaaaa aaatgcacat 89580

aatttgttac ctagcaattc catgtctaga ggcttatcct agagaaattc ttgcttatat 89640

gcataggaag acgtgtacta gaatgttcac tagttgaatg tttaagtgaa aattaggaaa 89700

taaagtaaat gttcattaac aggaaaatga gtaaaggtat atttataaaa caattaagta 89760

gctaaaatga ataaactaga gctgcgtgaa tgaactagaa ctggttcaat agtcatgtca 89820

gattattgaa tgaatacagg tcagatatgt atagagtgtc atttgtgtaa ttaatttttt 89880

ttttttttt gagatggagt ctcactctgt tgcccaggct ggagtgcagt ggcgtgatct 89940

cagctcactg caacctccac ctcctgggtt aaagtgattc tcctgcctca gcctcccgag 90000

tagttgggat tacaggcatg caccaccatg cccagctcat tttcctattt ttagtggcca 90060

cagggtttca ccatgttggc caggctggtc ttgaactcct gacctcaagt gttccaccca 90120

acttggcctc ccaaagtgct aggattacag gcgtgagcca ccgtgctcag ccatttgcgt 90180

gatttttaaa gatgtgcaga ataatgccat taaaaaaaat acacatacat gtatatatat 90240

acacgtttgg ctgggtgtgg tggctcacac ctgtaatccc agcactttgg gaggctgagg 90300

caggaggatc acttgagccc aggtgtacaa gactagcctg ggcgagatag caagacccca 90360

tctcaacaac agaaaggata attaggtatg gtggcatgag aggatcactt gagcccagga 90420

gttcgagtgt tatcaggcca ctgcactcta gcctggacaa caaagcaaga ccgtgtctca 90480

aaaaaataaa aataaaaagt atttgtatgt ggtcatagtc aaaaaacgta catggaagga 90540

aaatgtcttt atttatttat ttatttttt ttttttaaga cagagtcttg ctctgtcacc 90600

caggctgggg tacagtggtg taatctcagc tcaccgcaat ctcggcctcc cgggttcaag 90660

cgattcttct gcctcagcct tctaagtagc tgggactaca ggtacccgcc accacaccct 90720

gctaattctt gtgttttcag tagagacagg gtttcaccat gttggcaagg ctggtctcga 90780

actcctgacc ttaagtgagc cacccgcctt ggcctcccaa agtcctggga ttacaggtgt 90840

gagccactgc gcttggccag gaaatatcta atttagtaag tatttatatc tgggaaagga 90900

agggtcaggt ggtgattcat aggaactcta aagtctatgt ataatactta gggggacaga 90960

aggaaataaa gcaaaatgct gatatttgat tgttgagttg tgtatatgtt agaagtataa 91020

cataggagat ctgattgata gtaggagaat gtttttaggt ggtaaaagtg gaaccgtggt 91080

ggtttgtttt ggcagtagaa tcagttggtc atagtttgta tgtggaaggt aataaacaga 91140

-continued

```
ccatgttaag gatgacttcc ggaattttgg tctgagtagt gggtggatga cagtgtcatt  91200
catgagggaa gatgaagact gaggtaggaa caggtttggg agaagatgac atgttccctt  91260
ttagacaagt ggaattatgg aagatggcag gtaggtggtt agctatatga atttgagata  91320
aaagatttag gatggagata taaatttagg agtaacagcg tatctatggt attgtaagcc  91380
ttaagaatgg gtaggatcag ccaggaaata cagatgtata tgcagaagag aggagtcaag  91440
gaagccaaga caagttaatg tttaaagtga gtgatgtagt ccatgggcag atgctgctga  91500
gagggctgca aacaccagtg accctacaac atttttaaat gtcgtcttcc tgacagcagt  91560
gatcagtacc tgcaacgatc ttatttattt ttttcatgtt agtctccaca cacttgaatg  91620
tagacttttt gaaggcaaaa tcattgcctt ttctgagctg ggagcatgtc tggcacatac  91680
caagcactca acagttgatg tattgacttc atccagatac tctgagggcg agttatttcc  91740
tgctactagc ctttcacctt tcaatgttta agagcacaaa tacagagatg ggcacgtttt  91800
ggcatttctt attttgataa cctttcctg gtaagatttt ttaatgttga aaaaaaaaaa  91860
caagaaaaga gggttaaaaa tagtcttatg tcagatcctg tgatagaatt cacacttggc  91920
ttaagctgct gggcaccttc ctatcttgga tgtcatatta gcttatctac agcagaattt  91980
ttactgtttt atgtagtaag gaagcaatta tatgattatt ttacagacaa attattcttt  92040
atcttttatt tttttagacg gagtctctct ttgtctccca ggctggagta cagtgtcgcg  92100
atctcggctc actgcaacct ccgcctcctg ggttcaagca attctctgcc tcagcctccc  92160
aagtagctgg gcttacaggt gtccgccacc acacccagct cattgttttg tatttttagt  92220
agagatgggg tttcaccatg ttggccaggc tggtcttgag ctactgacct caggtgatcc  92280
acccgccttg gcatcccaaa gtgctggaat tacaggcgtg agccaccgtg cctggcccag  92340
acaaattatt atactctgag tgttagaggc ttaggatgtt ttcacttgat gctatgggag  92400
gaataagtaa taagatatga tacacaacca aagacctttc ttcactatgc ttctagtagc  92460
tagtactatg gatgacacat ggtaataata ttggttagca tttgtcctca atttactgtg  92520
ctagttactc ttctaagccc cttacaggta tatatttttt ttcatcaata atcctctaag  92580
gtagttttta ttattgacct aattttataa atcaagaaaa ttaagaccca gagaagtaag  92640
taacttgtcc aagatcacat ggcttataag tggtagagcc agaatttgac cccagatgtt  92700
gtgactacat tgtctctcca taagcaggtt caactctttt gactggatgc tgttccaagg  92760
tcacttcctt agagaagcct ttgctgacaa ctaccctcct gtgccctcct ccaaggctgt  92820
ccattgttct agaactttga atactcatct tagaataaag ctggtctaat ttttacagtg  92880
ttatagaatg gatctctgac tgcaaaagtt ggtcataatt atctttttat gttctagtga  92940
aaggcaaaga acaagagaag acctcagatg tgaagtccat taaaggtaag ttctgccctt  93000
ggcagtccac tgcattaaaa agtgatgtgc tttgcatttg tgagttcttt aatcctgtta  93060
tactctctct tttggcatta atcatttctg ccttatttta taattactta tgattttgat  93120
ttatttccct ctttaacctg tataatgctt taacatctag catataataa gtaggctttt  93180
tttttttttt ttttttggga gacggagtct tgctctgtta cccaggctgg agtgcagtgg  93240
cgcgatcttg gctcactgca agctctgtct cccgggttca caccattctc ctgcctcagc  93300
ctccccagca gctgggacta caggtgcacg gcgccacgcc tggctaattt tttgtatttt  93360
ttagtagaga cagagtttca ccatgttagc cagtatggtc tcgatctcct gaccttgtga  93420
```

-continued

```
tccgcccgcc tcggcctccc aaagtgctgg gattacaagc gtgagccacc gcacccggcc  93480
gtaagtaggc ttttttacc ttaattttat ttttttgaga tggagtcttg ctcttatccc  93540
caggctggag tgcagtggtg ccatctcggc tcactgcagc atccacctcc cgggttcaag  93600
cgattctcct gcctcagcct cccgagtagc tgggattaca ggtggccgcc accatgccca  93660
gctaattttt gtatttttag tagagacagg gtttcaccgt gttggccagg ccagtctcaa  93720
actcctgacc tcaagtgatc cactcgcctt ggcctcccaa agtcctggga ttacaggcgt  93780
gagccaccat gcctggccat aagtaggctt ttactgagcc ttgtgtgtat tggctatcct  93840
agtgattaca gtgaaccagt gcccttctta ttaatcacac atttaattgt tccctaaaag  93900
tgattagttc actttattta tttagtaaga caaaaaatga agaatactct taactgagca  93960
gtctgttaac tgtaggaaag cactgacact tataaggctt agttttctgt catttatcca  94020
gaagtatggt tgattacagt ttttactttt ttatttgaat gaacaacctt aatttaaaat  94080
atattttgtt tatttttgt tgggatcgat acattgtcct tgtttataga ttagagcatg  94140
ctttttaaag atgctgtatt actcactgat tttatttgtc cagtgtacag agattgaagt  94200
gggaaaatta taatggaaat tgtttccata gtcattacat attaatttca tcaatttatt  94260
tccataaaat ctgtagattg ctacttattt agatttttcc ttcaaatgtt tttatgttgt  94320
attgcttgca ctgagtattt attctatatg ctcaatttgc tggagaagaa gactaattat  94380
aacttaggca agttgtaaaa ttagggaaaa aagtaaggta ccttacagcc tagtttactt  94440
atttcttatg taaagccagt tagattccac attagttcaa actgccttct ttgagcaaaa  94500
cttgattggc agtgataaag gcttaaagcc cttctcaagc agagacctgt aaagactaga  94560
tctgactgta gtagaaggaa ggaacttaga tgtttcaggc agtgagaaca ccagtcttcc  94620
actctaaact ttgccactaa cagtatgacc ttgggaagtt gtaactttct tcagattctt  94680
catttgttga atgggggggat tggcctagct aatttctaaa tctctactgg gctaaaaaat  94740
tctgtgctta tactctgatt atgaagtaca taatctgtgc ttaacattca ctgacttatc  94800
cttaggataa tacagaagca gtacaagaaa cagcccctca agatgtttgc agtctggtta  94860
gaaagacaaa cttatacaca gaacagtagc aaatagacca aaataataat agctgccatt  94920
tatagaacac ttcttctgtt ctgggcatta gacaaaaact gactataacg gtgaacaaaa  94980
aagacttagg tcctgccctc attgaactta cagattagta ggggagagga acattaatca  95040
agtaattcca cagatggctt agcctagatt ggtagtgatg gaagtaaaga gatgtgaacg  95100
gacttgaaaa aaaattcgga ggcaaaatgg atagaagttt attattgatt aaatatgagg  95160
tgtgagagag agggatattt aagattgata cctaccttct ggcttgccta acagaaccaa  95220
aacaggaaat tatatgttca gttttgttat gttgggtggg aggtgctttt gagtcattca  95280
tttatatatg ttatatatgt tattttatat gcatagtaat tttaaggtct gagttttaaa  95340
ccaaaggtta gagagtgatt ttttagagtc tagcaaacct aagttgaaat cctgcctgtt  95400
gaaatggctg tttactagct cattaaccta gggcaaagta ttcaacttgt tttcattttt  95460
gtcttcatct ctaaaatgag gaaaatatgg tcttacaaga ttgtcctgag agatagatga  95520
aataatatcc aaaaaaaaaa aaggtacata gagaaactcg tatagtgcct ggtatatagt  95580
aggtcctcca ttggtagcta tcattatcta gttttaacat agccttcagt ttgttgaatt  95640
agtcaaactg agtgaagcac tgcaaggaat tcagaggaat ttgagatcaa caaatgattt  95700
```

-continued

ctgaagttta gggaagactt catggcaatg acacttacct tgtataaaag ttgaagaata 95760

agaaagattt gaatgagaga ttctttctct tctccctacc agcccagctt cttatttgag 95820

gatatattgg gcaaaggggc cttcagacaa gtagagggag atttttacag aaagattgag 95880

atgaaggtat agaaggctgt aaagaccaga aaagagaatt gagacagagg aagcaggaag 95940

ccactgtagg tttttgagca agatattgat gctgtaagta tggtgtttat gaaaggttag 96000

tctggaagag atttgcagga tggagacccc ggaagttttt ttgttataat acagaaagac 96060

ttgcactgag ggtgaggtgt taaaaataaa caggtaagta aatgtttaaa catcttgaag 96120

gaaaagtcaa caaatcttgg caagtaaaca gataacagtg aaaaagaatg ggaccaagat 96180

tttgagtttt ggagactggt ggattgaaca gacagggaaa ttgagaggag aatcagatga 96240

tgatgtttta agttgatatt tagacagatt gtgcttgaga tggtaaagtc aatgtgggtg 96300

ggaatgctta gtagcgagta atcagtgata caagaccaaa gcccaggtca aagacaagtc 96360

acagatacag atcagggctt tttcatctgc tccacagagg tgtaccctag gagctgttgc 96420

aaacagtcca tgtggagggt gtgagtaaga tgtttccctt gaatttgcca gaattacttt 96480

tttgttgttg ttgttgtttt ttctgagaca gattctcgct ctgttgccca ggctggaggg 96540

cagtggcgag atcgcgcagc tcactgcaac ctctgcctct cgggttcgag tgattctcct 96600

gcctcagcct cccaagtagc tgggattaca ggcttgtgcc accaagccca gctaatttct 96660

tttgtatttt tagtagagat ggggtttcac catgttggcc agactggtct cgaactcctg 96720

gcctcgtgat ctgcctgcct cagcctccaa aagttctggg attacaggcg tgaaccactg 96780

cacccggtcc cttgttaagt ttattttggt gggaagcaaa ggaggtttca gcttttaaaa 96840

agtttgaaaa ttattgctct ggtaataatt aaagatttga gagtaaatat gctttctagc 96900

agaaagaata aaagaagaac agatagcctc aagaagggga gccaaagaag caggctatat 96960

ctgacacact gggtgttgat aaatgggtat taaaagaatg agagcaatga gcagatagaa 97020

gaggaaatta ggagagtata ataccatgga gaccaagaaa gatagactat caggaaggag 97080

tggtaaaaat aagttactag ttctaagaga gatgttaaga gggaccgggg aaagccttgt 97140

acaaatgagt tagtagcatt ttacattata tacatctaat taagaaacaa tgcgagagtc 97200

tcaccattcc tatagactct tacttgtact tgtctgaaca cgaaaactgg cttttgttta 97260

taaataagct aaaaattatt ttgctccaat ttctcatgaa aataaaaata aaccttcttt 97320

taacattgaa aaaatagttt gaagacagtc actcttcatt ttgtaattcc cacaactatt 97380

attgaatgac tgaaattatc tttattctga agccaaaggg gtgatactga tatttcttca 97440

gactactaaa aatatatttt atgaattttt agtgtgcttt atctttttt gttttttttt 97500

ttgagatgga gtttcactcc cgttgctcag gctggagggc agtggtgcaa tctcagctca 97560

ctgcaacctt cgcctcccag attcaagcaa ttctcctgcc tcggtctccc aagtagctgg 97620

gattacaggc acctgccccc acacccagct aatttttttgt atttttagta gagacagggt 97680

ttcaccatgt tggtcaggct ggtcttgaac tcctgacctc aggtgatcca cccaccttgg 97740

cctcccaaag tactgcgatt gcaggcatga gccaccatgc ctggcctgag gaatatttttt 97800

ctaggttccc cccaccccaa gcatttattc tgcaatttta gttttgttcc taaagcaagc 97860

aaggtttaag gatttaaaaa taatccgtat tttagaatgc tttctggctt tgttactttt 97920

tatccacagt agaagttctc agagaatgat ctccctcttt taatttaact ttttggcaca 97980

-continued

```
gtattttgag aattataaat aatattagaa tgttttctgg ctgggtgtgg tggctcatgc  98040
ctgtaatcct ggctacttgg gaggctgagg caggagaatc acttgaacat gggaggcaga  98100
ggttgcagtg agccgaggtc atgccactgc actccagcct gggtgacaga gcaagactct  98160
gtctgggaaa aaaaaaaaaa aaaaaaagag tgttttcttt cctattttcc accacttgat  98220
taagttactt ttcctcttaa gtatttttg ctgagtatgc tgacttaaga gtaatgttac  98280
aaaatttaat ttttaaagtt ctctgaaagc ccctttatga gagttttagg ctatcaaatt  98340
gtgtttaatt cttaacaatt ttttgaaaaa ttatagcttc aatatccgta cattccccac  98400
aaaaaagcac taaaaatcat gccttgctgg aggctgcagg accaagtcat gttgcaatca  98460
atgccatttc tgccaacatg gactcctttt caagtagcag gacagccaca cttaagaagc  98520
agccaagcca catggaggcc gctcattttg gtgacctggg taagtaacta tcatttttta  98580
ttaacttgta ttagaaggat ttgagtacaa tatgtgaaac ttctgtcata ggatacagaa  98640
ctatataatt ggaaagtgct ttggaaaaaa tgtatttaaa ataacagcta caagtataat  98700
gggtagctgt gttgtgttcc tgtaaatata gaatataaag catgcccagt agaaaaacaa  98760
gcatttccag aagaaatata tctgatcact aaatataaat atatgaaaaa gatgtctcac  98820
tttattactg agggaagtgc aaattaaaat aatcagttaa tgttctccta acacattagc  98880
atatttttta aagtttgaca atttgaatgt cagtgaagat gcagggaaat acccctccta  98940
tttagtgata atataatctg gtgaagactc tttggaaagc aatttggaaa tcagtataaa  99000
atatgcatgt catttaggcc actctttcta agacctagcc ctcagatatg ctcattcata  99060
tgtgcaggtg tgtatgtgtg tgtgtgtgtg tgtgtgtgtg tgtatatgta tgtatgtatg  99120
tatgtatgta tgtatgttga aggctattca ttatagtatt gtttgtgata gcaaaaaatt  99180
atggacaaca tataaatatc tgttataggg aaataaccaa attgtggtat acgcatgctc  99240
tggagtataa tatagccatt tgtttctatt tatttatttt cttgagacag ggttttactc  99300
tgttgcccag gctggagtgc agtggtatga tcatggttca ctgcagcctt cacctcctgg  99360
gcacaagcca ttctctcgcc tcagcctcca gagttactag gactgcaggc atgtgtcacc  99420
acacccagat aatttttttaa ttttttgtag agacagggtc tcactatgtt gcctaagctg  99480
gtctcaaact cctggcctca agcaattctc ccacacaggc ctcccaaagt gctgggatta  99540
ccaacgtgaa ccaccacacc tggttcagtg tagccattta gaaatctaaa aaagacgtgg  99600
gaaaatgtct aaggcatgtt taaatgtgag aaaagcaagt cacagtatgc atggtaaaat  99660
ccgttatatt aaaataagtt cttccaaaac aaaaacatat gcaggagacc tttattttgt  99720
cagtatttct tacccaaatt tctgcactta gaaaattgca tgtcatgttg tcataagttg  99780
aaaaaaagat ccatgaacca atggacttct aataaaatca gtcctgcttt tgacatctct  99840
ctctactttt gtgtatattc aaaccagagt gtcaatgtgt ttgtggggca cacttagcaa  99900
taatacatag cagacaaaat gcatatagct cagagagtaa aattgtaagt tttgctagat  99960
cactcataaa ttgctgatga gaatttaaaa tggtgcagat gctctggaaa acaggcagtt 100020
tctttctttc ttttttttct tctttttgag acagggtctc actctgttgc gcaggctgga 100080
gtacagtggc gtgattacaa ctcactgcag cctcaccctc ctcaggttca ggtgatcctc 100140
cctcagtctc ctgagtagct gggactatag gcatgcacca ccacgcctgg ctaatttttg 100200
tatttttttt ttttttttct gtagagacgg ggtttcgcca tgtttcccag gctggtctca 100260
```

-continued

aactcctgga atcaagcgat ccacttgcgt aggcctccca aagtgctggg attacgggcg 100320

tgagctactg tgcctggcct aggcagtttg tttgtttgtt tgtttgtttg tttatttatt 100380

tgtagacgga gtctcacagg ctggagtgca gtggcccaat ttttggctca ctgcaacctc 100440

cgcctcccag gttcaagcta ttctcctgcc tcagcctcct gagtagctgg gatgacaggt 100500

gcctgccata atgcctggct gatttttgta tatttagtag atatggggtt tcaccatgtt 100560

ggtcaggctg gttttgaact cctgacctca ggtgatcagc ccgcctcggc ctcccaaagt 100620

gctgggatta caggcatgag ccgtcatccc tggctggtgg tttcttatga cgtgaaacat 100680

gcaattacca tatgacctag cagttgcact ctgtatttat cccagataaa tgaaaactta 100740

ccttccaata aaaacctgtg cacaaatgtt catagcagct taatattgaa aaactggatg 100800

ttcttcagca ggtgaatgaa ctggttcatt cataccatgg aataccattc agcaataaaa 100860

aggaacaaac tgttgataca tttaaccacc tggatgaata tcaagggaat tatgctgtca 100920

gacaaaaacc agtccctaaa gactacatat agtatgattc cgtttggata atattcttga 100980

aatagagaaa ttaagagaaa tgaaaagatt agtgtttgcc agatgttaga gacagggagg 101040

tgagaggggt aagtgggtgt agttataaaa gtgcaacatg agggatcttt gtgatgttga 101100

agttgtatct tggcagtgga tgcagaaatc tcaatgtgat aaaattacaa agaactaaaa 101160

acaagaatga gtatagataa aactggggaa atctgaacaa gttagagtgt tgtatcactg 101220

tcagtatctt agagtgatat tgtactatag ctttgcaaga tgttaccatg ggagaaacta 101280

aagtgtacaa gggatctcta ggtattatta ttttttttaga gatggggttt cactatgttc 101340

cccaggccgg tcttgaactc ctgggctcta gtgatccgcc tgccccagcc tcctaaagta 101400

ctggaattac aggcgtgagc gaccatgcct ggcccctttca gtattgtatc ttagaacttc 101460

atgtgaatct agcattatct catagaattt aattaaaaga aattgtaaac ctcacagaag 101520

atcagaattt cctcaagttt gtgatgttga caaagatgaa ctagttgaca ctgacagtaa 101580

gactgaggat gaagacacga cgtgcttcaa aaaaatgatt tgaatatcaa tggattaaga 101640

agaactcttt tgacaaattg atgaaaccct cagtcagttt tataagaatg cccatcttta 101700

tgatcatgct atgaaagcca atttttaaaa aaatttttttg tctttcctaa caattagctt 101760

gtggttataa tttaaattta gttaaatata agataaatga ttttttatta agtttagttt 101820

catttttcaa ggtacgatct caaagctact ctttaaccta ctatgaatga ataatgctga 101880

gttcataaca tctttgtaga tatatccaca attttccctc aggataagtg cctacaagtg 101940

gaattactgg actgaaaata atgcagtttg ctaagacttt gctatctgtt cctgaatgct 102000

cctccaaaaa ggttttgcca gtttacatcc tcatgaccag cgaatgagag tgttgcctat 102060

tttcctgtgc ccttgttact gcttaataat ttttgaaaaa aatctaattt gacagacaaa 102120

aatgcatttt atgttaattt gcttttctgg gatttttaat gaggttgagt atagttttta 102180

atatttttat tggccccttt ggaactagta tcataagttt tttttcttaa gaatttatgt 102240

agtctgggct gggcgcagtg gctcacgcct gcaatcccag cactttggga ggccgaggtg 102300

ggtggattgc cgaaggtcag gagtttgaga ccatcctgac caacatggtg aaaccgaatc 102360

tctactaaaa gtacaaaaaa tagctcagcg tggtggcggg tgcctgtaat cccagctact 102420

taggaggctg agtcaagaga atcgcttgaa cccgggaggt ggaggttggt tgcattgagc 102480

cgagatcgcg ccattgctct ccagcctagg caacaagagt gaaaagtctc aaaaaaaaaa 102540

-continued

aaaaaaaaaa aaaaaagaat ttacatggtc tgaattgcca ttaaaagaga tatgagaatt 102600

attgagtaac aaataacttt ttaataattt aggcaagttt tggacgattg tactttgttt 102660

agaaaccaaa agcatagtat ttgtagtttt tttatttact ttagttgcta ggaagtaaac 102720

tttattcaag gtctctggta ccagttgttg ctaaaagtga ttgactaatc tgtcaatctg 102780

aaattatttg ttgctgaact gctaattctt ttgcttctat cttttaggca gatcttgtct 102840

ggactaccag actcaagaga ccaaatcaag cctttctaag acccttgaac aagtcttgca 102900

cgacactatt gtcctccctt acttcattca attcatggaa cttcggcgaa tggagcattt 102960

ggtgaaattt tggttagagg ctgaaagttt tcattcaaca acttggtcgc gaataagagc 103020

acacagtcta aacacagtga agcagagctc actggctgag cctgtctctc catctaaaaa 103080

gcatgaaact acagcgtctt ttttaactga ttctcttgat aagagattgg aggattctgg 103140

ctcagcacag ttgtttatga ctcattcaga aggaattgac ctgaataata gaactaacag 103200

cactcagaat cacttgctgc tttcccagga atgtgacagt gcccattctc tccgtcttga 103260

aatggccaga gcaggaactc accaagtttc catggaaacc caagaatctt cctctacact 103320

tacagtagcc agtagaaata gtcccgcttc tccactaaaa gaattgtcag gaaaactaat 103380

gaaaagtgag tatgtgattt tcttgtgtgt acatatgtgt ctcactttct ttttttaatt 103440

tactaagcag aacttcagat gaggaataaa atgattggaa tatttttttt ctcctctaac 103500

tacttgtaaa tttgggagaa tttggagagt gtagtagagt cagatcagtg tatggaaaag 103560

gagcaggagt gactggacct tctaagaagt gtgttatcag aattagtaaa tgaagggtca 103620

aatgtcctac ttttcccctc cactgatttt gacatcaaac cattatccac atagccttat 103680

ttcctccctc ggtcttaatt ttattaatat tttactgcac tttgcagata aaatttttaa 103740

aaaattttta aaaattgcca ataagtgaca tttattaagt tcagtgctta gtgtatattt 103800

ggattttatt tattagtcac aagacctttg tgcaggtagt aggcatgatt atcttttttt 103860

ttttgagatg gagtcttgct ctgtcgccca ggctggagtg caatggcgcg gtctcggctc 103920

actgcaacct ccgggttcat gccattctcc tgcctcagcc tcccaaatag ctgggactac 103980

aggcgcctgc caccacaccc ggctaatttt tttgtatttt tagtagagac ggggtttcac 104040

catgttcgcc aggatggtct cgatctcctg actttgtgat ccgcctgcct cggcctccca 104100

aagtgctggg attacaggca tgagccaccg cgcccggact gattatctta tttacacatg 104160

agaaaaccag ggcttagaaa ggttaggtaa cttcctctag gttgtacagt aaatgtggac 104220

ctagaagcat tttgacaaga gcacctgttt ttttttcttc tctattagtt tagaaattat 104280

atactcttaa ttatcacctg ggattttgat tagacagcct tcatgttctt tttcatctta 104340

aatgttcttt gtgtcttaaa gggctaagtg atttcttcag atcttttagt tcactcattc 104400

tcagtgaact aaaatgaggt ctaatctgct actgaatcaa gttttcagca tgttatttcc 104460

ttcctcccta cctccctcct tccttcccta aaccaggctc ccgaggagct gggattacag 104520

gcgcccgcca ccactcctgg ctaatttta tattttagta gagacggggt ttcaccatgt 104580

tggtcaggct gatcttgaac tcctgacctc aagtgaccca cctgcctcgg cctcccaaag 104640

tgctgggatt acaggcatga atcaccacac ctgacggcat gttattttca tcgcaaagtt 104700

actgtaagct gggagaagtg gcacacactt gtactcccag ctactcagga agcttaaggt 104760

gagaagattg cttgagccca ggagttttga gaccaacctg ggcaacacag caagacccca 104820

-continued

gctcaaacaa agaaaaaaag ttattgaatt ttttatttct atggatcatt ttttgtagtt 104880

tcttattcct ttcacccttc attcccactt ttgatcccat cttttattta tttagtttta 104940

ttaaatgtat atttgtctga taattctgct atctacagtt ttttgtggac ctgactcagc 105000

atttctttgt ttcttcggat tcagactgtt ggtggcttgt gattttagtg atttttggcc 105060

gtgaacatgt ttcttggact tttgtctgtg ggaattctct gtgtactctg tataaattaa 105120

gttacttcag gtgttttgca ttttcttttg ccatgcacct ggggcctggg tcactaccct 105180

tctggtacca cttaaaactg aatttttgtc ttgggtgctc gtactgatcc tgtatgagta 105240

caggtttata cttactgtag aaatatggtg tttgattatg gggtattgtc ccagatggtg 105300

ctggagtatt aatatgctct ctgttaaact taatgtgttg tccctgtaaa actccaaaat 105360

tctgaattcc agaatactac tggccccaaa tgtttaagat aagggcactg cctgtatttg 105420

tttctgcctc ccactatttt ccttagttta acacaaactc acctttttaa aaaacatttt 105480

gagagaattc agtattggga agagtttcta acctgtttct ggaaatggaa gtccaaagtc 105540

tgtttctgta attgtttttt ttttgagatg gagtctcact ctgtcaccca ggctggagtg 105600

caatgacgta ctctcagctc actgcaacct ccacctcccg ggttcaagcg attctcttgc 105660

ctcagccccc tgagtagctg ggattacagg tgcccaccac catgcctggc tgatttttgt 105720

atttttagaa gagatggggt ttcgccatgt tggccaggct ggtcttgaac tcctgacttt 105780

gtgatctgcc cacctcagcc tcccaaagtg ctaggattat gtttctgtaa ttgtaataca 105840

tttattgttt ttagaaactg tctttgcttt agtggtaatt ttcaataaaa atagaaatag 105900

cagtggagtt attaaaagag cattagttac atttttccct ttttcattat cttcaaatat 105960

tatatatagt aagtttgacc tttttaaaat gtatacttgt atcagtttta acacatacat 106020

agattcctgt aactgtcacc actataaggg taaagaacag ttagttcctt caccttgaa 106080

gtcaagcccc acctctatcc caacacttgg caaccgctga tctttctccg tctcaatagc 106140

tttgcctttt ctctttttt ttcttatttt tttttttgag acagcgtctt gctctgtcgc 106200

ccgagctgga gtgcagtgag gcaatctcgg ctcactgcaa cctccgcctc ctgggttcaa 106260

gcagttctcc tgccttagcc tccctagtag ctgggattat aggcacgcac caccacaccc 106320

ggctgatttt tttgtatttt tagtagaaat ggggtttcac catgttggcc aggctggtct 106380

caaactcttg acctcaagtg atccacctgc ctcggcctcc caaagtgctg ggattacagg 106440

cgtgagccac tgtgcccaat caggacttt ttttttaaa tttacattca acttgtcatt 106500

tttttcttgt atggattgtg ccttcagagt cacacctaag agcccttgc ctaagcaaag 106560

gtcatgaaga ttttctcata tgtttccttt taaaagtatt gtggttggcc aggtgccatg 106620

gcttatgcct gtaatctcag cactttgaga agctgaggtg ggcagattac gaggtcagga 106680

gatcgagacc atcctggcta atgcggtgaa accccatctc tactaaaaat acaaaaaaaa 106740

aaaaaaatta gccgggcgtg gtggcgggca cctgtagtcc cagctacttg agaggttgag 106800

gcaggagaat agtgtgaacc cgggaggtgg agcttgcagt gagccgagat cgcgccactg 106860

cactccagcc tgggcaacac agtgagactc catctcaaaa aaaaaaaaaa agtattatgg 106920

ttttacactt tacgtttaga tatatatctt ttttgagtta atgtcgtata agtatgaggg 106980

ttacgtcaga ttttttgttt tttgtttatt tttacatatg gatgtctagt tgttctaata 107040

ccatttgttg aaaagacaac ctttactcca ttgaattgcc tttgtacttt tgccatattt 107100

-continued

gtctaggcct gtttttggac tccttttttct gtttcatgat gtgtgtgtct attcctttgt 107160

taataccaca tggtcttaat tactgtatag taagtcttaa aattgggtaa tgctggcctt 107220

ataaaacgaa ttgggaagtt tttattttta ctcttatttc cattttctag aagagattgt 107280

gtagaattgg tgtcatttct tctttagata tttggttgaa ttgggaagtg atgccatctg 107340

ggcctagggt tttgtttttt gtgtgtgaga cagagtctca cttctgtcac ccaggttgga 107400

gtgcagtggt gagatcttgg cttactgcaa cctctgcctc ccaggttcaa gttatcctcc 107460

tgcctcagcc tcccaaatag ctgggattac aagcgtgtgc caccatgccc gactaatttt 107520

tgtattttta atgcagacag ggtttcacca tgttagccaa gctggtctcg aacttgtgac 107580

ctcaagtgat tagcccacct tggcctccca aagtgttagg attatagatg tgagccaccg 107640

tgcctggcag gggcctaggg ttttcttttt cagagtattt taaactatga attcagatta 107700

tttaatagat ataggactat ttaagttatc tgtttcttct tgagtgaatt tttactgtag 107760

tttatggcct ttgagtaatt aattgtattg aattgtcaaa tttatgagcg tgtaattatt 107820

tatagcattt cgggtttgta gtggtatccc tcttttattc ctggtgttgg caattgtgtc 107880

ttgtttttct ttgtcagatt gtatagggat ttattagtct tttcaaagaa ctagcttttg 107940

ttttgatttt tctgttgttt tgttttcaat tttattgatt ttctgctctt tattatttct 108000

tttctattat ttctgcttgc tttgggttta ttttactctt tttttttttct ccaagttgct 108060

taaagtagaa acttagattt ctggtttgag acctttcttt tctaagataa gcatttaata 108120

ctgtaaattt ccttctaacc actgctttag ttacaccccc acaaattctg gtattttgaa 108180

ctgagcacaa atgaaatgtt ctaatttccc ttgaatctta ttcttttacc aatgaattat 108240

ttagaaatat gttatttagt ttgcaagcaa ttggagactt ttttcctgtt atttttctac 108300

catttatttc tcatttcatt atattatggt cagagaatat attttgaatg atttcattta 108360

ttaattttta aaaataacat taaaaaattt tttaaaatgt gaatatacca catacagtat 108420

aaagattgta cattctgttt ttggacagtt ttctataaat gtcaagttga tttagttggt 108480

taatgatggt gttcagtttt tctttattct tgctgatact ttgtatgcag ttatatcact 108540

ttattactca gaagagtgtt gaactttcca actacaattt ttttttccaa ttttactttc 108600

agctctatct ggttttgctt catgtatttt gaggctctgt tgttaggtgt gtacacattc 108660

aggatgatat cttctgggtg aattgcctgt tttatcatta tgtaattccc tctttatggt 108720

aattttcctt gttctaagat cagaaatatc tgttgtccaa tttatataga cactgcagct 108780

ttcatttgat tagtgcttgc atggcatatc tttttccatt tttttacttt tgatctacct 108840

ttataattct atttaaaggg ggcttcttgt aggcagcata tagttgggta gtgttattta 108900

tttatttatt tatttattta tttatttatt tattgagaca gagttttgct cttgttgccc 108960

aagctggagt gcagtggtgc aatcctggct taccacaacc tccacctcct gggttgcagt 109020

gattctcctg cctcagcctc ccaagtagct gggattacag gcacgcgcac catgcctggc 109080

tgatttttttg tatttttagt agaaacggat tttcaccatg ttagccaggc tcgtcttgaa 109140

ctcctgacct caggtgatcc acctgctttg gcctcccaaa gtgctgggat tacaggcgtg 109200

agccactgca cccggctgag tcatgttatt tttaatcttt tctcacaata cagggttttt 109260

gttggtaaat ttaattattt taatataaat tttagtataa ttatttacat taaatgtaac 109320

tgttgcactg gggtatttat aatgtgtaaa tataattatt ggtattaata taattatatt 109380

-continued

actcataata atattaatat ctttggattt agattaccag tttagtatat gtttttctgt 109440

ttctccctct ttgatttccc ctttttttgct ttttttttttt ttttaattct tatttttttt 109500

tagtatttgt tgatcattct tgggtgtttc ttggagaggg ggatttggca gggtcatagg 109560

acaatagttg agggaaggtc agcagataaa catgtgaaca aggtctctgg ttttcctaga 109620

cagaggaccc tgcggccttc tgcagtgttt gtgtccctgg gtacttgaga ttagggagtg 109680

gtgatgactc ttaacgagca tgctgccttc aagcatctgt ttaacaaagc acatcttgca 109740

ccacccttaa tccatttaac cctgagtggt aatagcacat gtttcagaga gcaggggggtt 109800

gggggtaagg ttatagatta acagcatccc aaggcagaag aatttttctt agtacagaac 109860

aaaatggagt ctcccatgtc tacttctttc tacacagaca cagtaacaat ctgatctctc 109920

tttcttttcc ccacatttcc cccttttcta ttcgacaaaa ctgccatcgt catcatggcc 109980

cgttctcaat gagctgttgg gtacacctcc cagacggggt ggcagctggg cagaggggct 110040

cctcacttcc cagatggggc agccgggcag aggcgccccc cacctcccag acggggcagt 110100

ggccgggcgg aggcgccccc cacctccctc ccggatgggg cggctggccg ggcgggggct 110160

gacccccccac ctcccctcccg gacggggcgg ctggccgggc gggggctgac cccccacctc 110220

cctcccagat ggggcggctg gccgggcggg ggctgccccc cacctccctc ccggacgggg 110280

cggctgccgg gctgaggggc tcctcacttc gcagaccggg cggctgccgg gcggaggggc 110340

tcctcacttc tcagacgggg cggccgggca gagacgctcc tcacctccca gatggggtgg 110400

cggtcgggca gagacactcc tcagttccca gacggggtcg cggccgggca gaggcgctcc 110460

tcccatccca gacggggcgg cggggcagag gtggtcccca catctcagac gatgggctgc 110520

cgggcagaga cactcctcac ttcctagacg ggatggcagc cgggaagagg tgctcctcac 110580

ttcccagacg gggcggccgg tcagaggggc tcctcacatc ccagacgatg ggcggctagg 110640

cagagacgct cctcacttcc cggacggggt ggcggccggg cagaggctgc aatctcggca 110700

ctttgggagg ccaaggcagg cggctgggaa gtggaggttg tagggagctg agatcacgcc 110760

actgcactcc agcctgggca acattgagca ttgagtgagc gagactccgt ctgcaatcct 110820

ggcacctcgg gaggccgagg caggcagatc actcgcggtc aggagctgga gaccagcccg 110880

gccaacacag cgaaaccccg tctccaccaa aaaatgcaaa aaccagtcag gtgtggcggc 110940

gtgcgcctgc aatcccaggc actctgcagg ctgaggcagg agaatcaggc agggaggttg 111000

cagtgagccg agatggcggc agtacagtcc agcctcggct ttcacaactt tggtggcatc 111060

agagggagac cggggagagg gagagggaga cgagggagag ccccttttttt gctttctttt 111120

ggattatttg aatttttcct taaatttatt tatcttactt atttatttat ttttttgagt 111180

gattctcctg ccacagctcc caagtagctg ggactgcagg catgtgccac tacacccagc 111240

taatttttttt gtatttttag tagagacagg gtttcaccat attggccagg ctggtcttga 111300

actcttgacc tcaagtgatc cacctgcctc ggcctcccaa agtgctggga ttacaggcgt 111360

gagccaccat gccctgcctt tttctagaat ttatatattg agttcttgat tgtatctttt 111420

tatgtaggct ttttagtggc ttctctagga attacaatat acatactttt cacagtgtac 111480

tcacatttaa tattttgtaa cttcaagtgg aatgtagaaa acttaaccac cataaaaata 111540

gaactaggga tgaggttaaa aaagagagag aaaagaaatg taataaagat ttaataacac 111600

cgttttttttt ttttttttctc ttttttttttt gagacagagt ctctctttct gttaccaggc 111660

-continued

tggagtgcag tggcgtgatc ttggctcact gcaacctccg cctcctgggt tcaagtgttt 111720

ctcctgcctc agcctactga gtagctggga ttacaggtgc gcgccaccat gcccagctaa 111780

tttttgtatt tttagtagag acggtttcac tgtgttggcc aggatggtct cgatttcttg 111840

accttgtgat tcgctctcct cagcctccca aagtgctggg attacaggcg tgagccaccg 111900

cgcccggcta agtctttaaa tatttttttg acattgcact ttttctcttt tccttctagg 111960

attttagtaa cccaaatgtt agttttgtta ttgtttggca ggttcctgag gctttcctta 112020

cttctttaaa ttttttttcc ctgttgttca gcttcgaaaa tttctattca tctgtcttca 112080

aattcactgg ttctttcccg ttatttccat tctgttattg agtctttgta gtgaatttta 112140

aattttgttt attatgtttt ttagttctaa aattttcttt ttttgtgtat gtcttatact 112200

ttgctcctga aactcttatt tgtttcagga gtgatcttat ttcttagagc atggttttag 112260

tagctactta aaatttgttt tatcatccca gcatatgtgt cctcttgatt gtcttttctc 112320

ttgtgagata atgggatttt ctggttcttt atatgacaat taattttgga ttgtatcttg 112380

gacagtttga cttacgttac atgattctga atcttgttta aatcctgtgg aaaatattga 112440

agtttttgct ttaacaagca gttgacctag ttaggttcag tccacaaatt ctaagcagca 112500

ttctgtcggc tctggttcca tcatcagttc agttttgtat cttatctgct tatgtgcctt 112560

tctgtgtcca gtctgggacc tggccaatgg tcaggtccca aagcctttgt acacttttag 112620

aagcagggcc atgcacaccc agctcacgag tggccccggg agtgcacata caactcgacg 112680

ttttcatggg ctccttcttt tctgtgatgt ccctgacacg ttctgccttc taagaacctc 112740

cctttatccc tttcctgttg tctggctaga aagtcagggc tttagattcc ctatacttca 112800

gcacacttcc tgtagctatg tcaacctctg tggccacgac ttcttcttct tgggactgca 112860

gtttctcttg tcagaaagta ggattcttgg agctgctgtc attgctgctg tggctgctct 112920

gatgctgcct gggagtcgaa ggagagaaag gaacaaaaca aaacaaccca ggggatttcc 112980

tccactctct ttgatccgtg agagcccccc ttcctgttcc tcagaccaga aatagagggc 113040

ctgtcttgga acttcttctt tgtgcatctg gtgtgcagtt tcagcttttg agtccaggcc 113100

aggaggtgct ggacaaactt gtcaggagta cggaggtact gcaagttctg attacttttc 113160

tcagtccacc tgcttccaag tccttggatg catttgtcca ttgttttgag ttgcattcca 113220

tgggagagac agaagagtgt gcttatttca tcttgacata cttattagga tttcatatca 113280

aatcaacgga tgatattctc tatattaatt tgctgttttc cctttagcaa gcacattagg 113340

aaaataacac tttaacaccc gcctttggtg gtttctgtca taattattaa tacttgactt 113400

ttttttttct tttgagacgg agtctcactc tgtcctttga ggcattgtcc ccataaactt 113460

ttggtaaagc atcaataatt ttatctttca tccacacaag cttcaccata aatttgatgt 113520

ttattcttcc attttagcag aattcatgtt gctccaatag gggctgtctt caaactgatg 113580

ttttctcctt cttagtgcct cagagtagat cctgttcaga tacgttataa caggttaata 113640

tgagtttatt ttggtgtaaa agtactttga aattcatgca tagtttttc atcatatgca 113700

ttttccatag ctttgaacac ccccatgtaa ctctcctctt ccacaaacca aacaatgaaa 113760

aagcaccttt gtgatggaag tttattttgc aataggaact cacagtgatc taagccctgc 113820

tattcatgaa tataattcat tactggagtc caagttgctt tttggttttt gaagttctct 113880

tcttcccttg caggtataga acaagatgca gtgaatactt ttaccaaata tatatctcca 113940

-continued

gatgctgcta aaccaatacc aattacagaa gcaatgagaa atgacatcat aggtaagcag 114000

tgcttgaaac tatggcaaaa aaaaaatgac aaaaaatgca cagaactgac aattttcgtt 114060

attgactaag ataatttttt cttaacatgg aatttagcag ttcccttcct aatttgtttt 114120

ctgagtattt tttatatcgg attatagctc actttaaaag tttctcggct gcattcggtg 114180

cgagggtctt tgcctgggcc agatgggctg cagtgtagcg ggtgctcagg cctgcccgct 114240

gctgagcagc cgggccggcg ggcggctacg ctaaccggca cagaccaccg gatggactgg 114300

ccggcagccc cgcaccagtg cacgaagtgg gcgggacaga aacttctggg gttggaagtc 114360

cagtgaggct aaaagccggt accaaagtct ctaggcatca gggctgcagc ccaagagtct 114420

cacgaccagt gggcaactgg atggccagac aggtgtctca gtggtggcct ctccgtctca 114480

gggcttcatc ccacttctca gtgggcctga cgtccctggg caccctggat gtctacctgc 114540

attagccaga gccatcacat ggcctgtgac ttgccttttt ttgccagttg attgtgccac 114600

acacagtgtc atttctgtgt catttggcac agctggaggt gcaaggagga gggcagcctc 114660

atgtccagtc ccagtttcac gtaactttat tcttctgaat aaagacaatt tgctaacctt 114720

aaaaaaaaaa aaaaaaaaaa agtttttctt atatgttgga cccaaattct taggctttaa 114780

cctgaataac aatgacagca agatcaataa atagtacaca tttattaaac actcactgtg 114840

tcccagacaa tattccaagc acttttatg gatagactca ttttaacttc taaagaactt 114900

tgtgggataa atacagttat tttatagatg aagaaactga agcacagaga agttaagtgc 114960

tttgtccagg gtaacagctc agatatggca gagtcaggat ttgaaactag accctcacat 115020

accttaactg ctgtgctgtg gcagtgtttt tcatactgta ggttgggacc agccttctct 115080

tatgccctca ccccctgcca aaaaaaaaaa aaaaaaaaaa aaatatatat atatatatat 115140

atatatatat atatatatat aatatatata tatataaaat atatatatat ataaaatata 115200

tgtattagta tatatgcata tatagtatat attatatatt agtatatata ctaatatata 115260

atatacatat tagtgtgtgt atatatatat atactagaat aaaaaaatca aagtatctca 115320

gagtagtaag gacaaacatt tcagaaaaat gttttcatta tatatacatg tatgtatgtg 115380

tatgctgatt caacaaatat atttcttata ggttatagca aaatagtttg aaagctttta 115440

ctgtgtttta tcaggaagac cttaggtgaa cgtatattca cagataaaag aggttattta 115500

ttcattcaat aaatattaca ttctcataag tcctaatatt atgtattttt attcttcaaa 115560

aaagttagta tttgtgattt atgaaataag acatgttctt gcacttttag cagatctgtc 115620

ccgatgttgg gcttctttaa tccttagtgt gggtgctttg cactcactca ctgctgggga 115680

cagcaagacc cctgttagtc tcagctgtgt ttcttaaatt ggcccactgt accttccagt 115740

tagctattct ggggtccatg tcatgttggc tccattttcc ttttctttct cccacacaga 115800

tacctataac ggctataaca taggcctggt ggctgttggt ggcttatccc tatctgcttg 115860

tatttaaggg gtactgtttc actgagtttt gctgacagat gttgtcatga gatttgaggt 115920

tttctgtgtt gttgctctat ttttatgtgg gaatttgcta ctatcatcat ccctagacca 115980

gcttttccta gtaatacaac agggatgttc tgactgatta gagtttgcct gtttgaagaa 116040

ttggttggct agtgattttt ttttgagggg agtctgtacc agttaatagc ctgactgggg 116100

tgtggataaa aaggaagcag tttcaagtca aataaaacac ttaaaatgaa accacactgc 116160

aactctcttt cttttactta agcttaatca aattaatgat gatgtaatcc catgaaggaa 116220

-continued

aagtcttctg aaggatcaag ttgataacat tttgtgatca aagaatttga gaaaacctct 116280

atcccagtgt ctatcattat atattttagg atgttaatta cctgtgtggc tttaggcaag 116340

tcatttttcc tccttgagcc ccattcttaa tcctgtccaa attatttgtc tcctcttgca 116400

gttggactat tttaatatag ctgtccttca agtgagtttt gttcaaagga gccttcactt 116460

tagctcttac tgtgtaccca ctttgcatag tcttgtttta aatgtaatcc ttggattttt 116520

ggtgttgcta actaattact gtttttatgt gaggatttag agtgatccag aatctatact 116580

tgcactacct ccttcatctt ccacaaatgt ttgaagtggt agaattttta aaaactttga 116640

aggtacagct gacagaattt gctgatggtt tggaagtgag tggtatgaga gggaaaaaaa 116700

ggaataaagc atgactgcat tttttgtttg tttgtttgtt tgtttttgag acggagtctc 116760

actctcgcca ggctggagtg cagtggcgtg atcttggctc acggcaacct ccgcctcctg 116820

ggttcaagcg attcccctgc ctcagcctcc caagtagctg ggactacagg cgctcgccac 116880

cacgcctggc taatttttit ttttgtattt tagtagaaac ggggtttcac cgtgttggcc 116940

aggatggtct ccatctcctg acctcatgat ctactcacct tggcctccca aagtgctgag 117000

gttacaggca tatatataag catataaagt gtgttatagc atacaaacag gtatatatat 117060

aaacatgcag tccacacagc tgataggaat gaggcagtag tgaaggagaa gttgatgtag 117120

gagaggggac agttgttaca ggaaagaagt ctggaggcag aagggatgaa ttccagtgct 117180

cacatagaag attgcttaga tgggagcaag gacaatttat ctagagtcac aggaaagaat 117240

gcagtacacg ggtagagatg caggtgagtt gaaagatgtg agagatgatg gaaataattt 117300

tctgattgct tctatattct caaggaagca ggaagcaaag tcctcagcaa agagaatага 117360

agaggtgtta aatatttgag aaaggagatg tactgtagaa aaaaaaaaaa ctcagtttct 117420

ccttctgaac tctcacaaaa cagaaccctt ccatgactct agttgtgtgg ggtttttcc 117480

ctgtcagcta ccaattctgc agatgattgt tcagtgaaca ccaactgggt gtcctctaag 117540

tcagttcagt tctcacactg tttacctgga gatagcatca gatcccacag attgaggact 117600

ctgtcccaca agactgcctc cacttcagat gccagtctca agtacaagtt gtggcctgtg 117660

cttctgactg accttctata aattggagtt cccacagtcc cctccttggg ttcaataaat 117720

ttgctagagc agctctcaga actcagggaa atgctttaca tatatttacc catttattat 117780

aaaggatatt acaaaggata cagattgaac aggcagatgg aagagatgca tgggcaaggt 117840

atgggagagg ggcacagagc ttccatgcac tctccaggtc atgccaccct ccaagaacct 117900

ctacagattt agctattcag aagccccccc ccccattctg tccttttggg ttttttgtgg 117960

agacttcatt atataggcat gattgatcat tggctattgg tgatcagctc aaccttcagc 118020

cccctcatcc cgggaggttg gtgggtaggg ctgaaagtcc caaacgtgta attctgcctt 118080

ggtctttctg gtgattagcc ctcatcctaa agctctttag aggccacagc cacaagtcat 118140

ctcattagcc ttcaaaagaa tccagagatt ccatgaattt taggcgctgt atgctaagaa 118200

actggctaaa ggccagttgc aatgtctcag gcctgtaatc ccagcacttt gggaggctga 118260

ggcaggagga tcgtttcagg ccatgagatc aaaaccagcc tggtcaacat agtgagaccc 118320

ccttacaaaa aatttaaaaa ttggccaggc gtaatagctc ttgtctgtag tctcagctac 118380

tcagaaggct gaggatcact gagccctgga gttgaaggca gcagtgagcc atgatcgtgc 118440

cactgactcc ggcttgggtg acaaagtgag accttgtctc agaagaaaaa ggaaaaaaaa 118500

-continued

aaaactgggc aaagactaaa taacatattt cacagtatca cagatttgta ttgtctagga 118560

aagtgaatgt aaacagacca ggacactagt atgatccctt ggtttcatga aggtcccact 118620

aaagtcatga acacaaagtg agactaggca tcatgttata tggtttttcc agccatgttt 118680

aacagctagc taaatagcta attgtttcgc tgcagtttat tttagcagtt ccttatttta 118740

gcacatttca tgttttaaaa tttctaccaa taacatttta ataaactttt ttacagataa 118800

cttcacaaat ccataatttt ttaagttaca atcccagaaa tagaattgct cattgaaagg 118860

gtatgttcat ttttaaagtt atgctagaaa ctgccaaatt gccttcagaa aaaggtgttt 118920

gtatccccac taacactagt gttagttttc ttgtgccctt gctcaagtat acatattatt 118980

aaaaacaatg ttgggccagt ttactagata aaaggtgtag tgcctcctta ttctaatcta 119040

tttgattact agtgagtatg tatgtctttt cacgttggtc attttatgtt tgttcctttg 119100

tggattgtca tgtcctttgc tcatttttct tttggaacat ttcttagtag tttataagag 119160

ctcttggtat tttaatgata gtaacctttt aactgtcatg catgctgcaa atcttttttc 119220

tgtttgtttg cctttgtatt ttgtttttgg agggtttcta tgtataggaa ttaaatttta 119280

tgttgttaaa tcttttgatt tctgcttttg catatgtact tcaaaagact ttctatttta 119340

agatcaagtg ttacctgtat tttcttttag ttctatttaa aacctcttaa tttatatgcc 119400

tgtgctgtta actcccaagt tgattcacaa gtgtgtatac atagtttgaa tttagtggca 119460

atttaattat ttacaacttc ttttgcagca aggatttgtg gagaagatgg acaggtggat 119520

cccaactgtt tcgttttggc acagtccata gtctttagtg caatggagca agagtaagtt 119580

agttcatatt ttcacattgt gcatcctagg gaatttgggt tcattgttag gaatgggctt 119640

cactcagcta aaaacaaagt atttttgaga atttaaatat tttggatatt tacaagatca 119700

tataaagcat actctatctt ggttaacagt ttcttttaaa tataaattat gtgaactctt 119760

aaaattttca ttttcatttt caatgttaat atttcctaag ttaaaataat ttgtttttag 119820

ttctgaaata atttggggag tgattgagtc tgtagtgatt atgactatta gaattggttt 119880

atttatttaa ataatgcatg tcttcagatg gctctcctaa tttgttagtt aggctttaag 119940

ctaaatggat gctatataac taaatccaca tagatttgtt gaaatggctc cagaggtttt 120000

ttagatttat tactgctatg tgcccttaaa aaaaatctat tcattctttc acttaacatt 120060

tatcagaaga gtgctctgtg taagacgtgg ttaggcatag tgccagtctt gaaggaagtt 120120

acagcctaat aaaagacata gggcatgttg tttggttact gtaatatgaa gtggcatgtg 120180

ttaaatgtca ggggagaact acaaagtcat aaaaaggtgg gagagattac atacaggtaa 120240

aggaatcagg aatgacacca tggggagtaa ggtagtgttg acctaggcct ttaagataca 120300

atagggacag tatggaaaga gtatattttt cccacttaaa ctctttcctt ggtcgttccc 120360

tcaaattttc ccttttgtcc atgtgcaggc actttagtga gtttctgcga agtcaccatt 120420

tctgtaaata ccagattgaa gtgctgacca gtggaactgt ttacctggct gacattctct 120480

tctgtgagtc agccctcttt tatttctctg aggtaaagtc tgcatttctt ttcacactct 120540

attcgagcat tccagcctct aactatcaat gctggggccc tgtctatagg aaataacaca 120600

gaagagccaa gtcatttcca aaaagatgta tcattgtttc aagttgtttc tgatggcaag 120660

agtaatttaa taatatatta gagagaacat gaaaattcaa tgtattaaat aactctaatt 120720

ttgagaaacc taattaaact actgcatgta agagagtgca tgtttttaat tatttggagc 120780

-continued

tattttaaaa ccacagaatt tgaaacttgc ttccagtgca taaattgcag accagacttc 120840

agaagagaaa aaaagtagta aatttttttct tatgctcatc atttttactt tagtcacttg 120900

ataggattgc ccagtgaaga agcatttgca acagacaatg agtatattaa tctttttgag 120960

gcatacagtt tagtataatg ctctttgtta ggcttcaaca agtgaaatta ttttgttgga 121020

aagcaaatga ctattaagta gaaagaggat tcccagtctc acaaagcagt aatttagaca 121080

ctcgattctg cctctttaca agaatacagg tactcagttg atttgttttc tcactccctt 121140

tctttgctat aagtttaaat caacaatttg tttaggttaa tatgtcctca tggaatggtg 121200

gaaatgatca gatataaaat atttggtttg gttagtttac tctttatatg tttgctggca 121260

aggaaccaca aatccagttt agtataattt ttactctagt tcactaaaag tttgcatcca 121320

gctgtgtagg tagtgtttgt ttcttgttaa ctttttttc gtctaaaaga atactttaaa 121380

acttttcaat ctcaaatgac tgtaacttgc tgacaggtgt taacagaaga agtagatctt 121440

tttgtttttt gcttatgacc tgtattttaa tatttgagct tatagattag agattgtgag 121500

agaaatctgt ttatagtctt attttccctt gtgtattttt tcttcctagt acatggaaaa 121560

agaggatgca gtgaatatct tacaattctg gttggcagca gataacttcc agtctcagct 121620

tgctgccaaa aagggccaat atgatggaca ggaggcacag aatgatgcca tgattttata 121680

tgacaagtga gttatattga tagatggatt cagcagatac ttattgaaca tttgatatgt 121740

tttgtggaaa taaagatgaa taaactcagt ctctgttgtc aaggagctca caggaggcag 121800

cataaaagct gcttttatat ggtgtttgta aagctttggg ggttcttaga acaaaagttt 121860

ctgctgggaa aggggaggtg tatgtggggt aaacaggatg gcaatggtgg tgttcaagga 121920

gtgtttccca gaagagagat tttgtttgga tcccaaagaa agaagggaat tttgctaccc 121980

agagaaggca gaaaacaaca ttctaggcaa aggcattggc ccagaagcca tggaaacgta 122040

ggggaaagtg gcactttcaa gaaacttgag tttagataat caaaggagtg gggaataaat 122100

atgaggatgc tggtactaat tggaatagat tgtaagggac cttgaatgcc tatttatggg 122160

tatattatac tttctgtata aatctgctca ggcacgttgt taattagttt tttattagtt 122220

ttcactgaaa atgagaggat ggaaacatca tacagtaaac aaaattgaaa atatctggtc 122280

aggcagatga tgagcttgtg gccagctctg taacgtatgg tattcttttc atttaacttt 122340

tcttactctg taaaaaaagt aattcgtggt cgggcacggt ggctcactcc tgtaatcaca 122400

acactttgag aggcagaggc aggtgaatcg cttgagccca ggaatttgag accagcctgg 122460

gcaacatggc aaaacccgcc tttactaaaa atacaaaaat tagctgagcg tgatggcgtg 122520

cgcctgttgt cctagctact taggggcctg aggcagaagg atcacctgag ccttgggagg 122580

tcgaggctgc agtgagctgt gatccactgt actccaccct gggcagggca gtagagtgag 122640

accctgtctc caaaaaaaaa aaaaacaaca aaggtaattt gttatttgta tccttaagca 122700

aatgctaaag gggtaacttg gggatagaga aaagtccaca gatgttaggg tttgaagaca 122760

ctaatagtat ctaggccagt ggttcctgaa cattagtctg tgggctcttg ctgggctgtc 122820

tgcataggaa tcacctgaga gcttattaaa aataggtttt caggctggtt gcggtggctc 122880

acgcctataa tcccagcact ttgggaggct gaggcaggcg gattacttga ggtcaggcgt 122940

tcaagaccag cctggccaac atggtaaaac cccgtctcta ctaaaaatac aagaattagc 123000

caggcatgat ggcacacacc tgtaatccca gctactcagg aggctgagga aggagaattg 123060

-continued

ctcgagcccg ggaggtggag gttgcagtga gcggagatca tgccactgca ctccaggctg 123120

gctgacagag ggagactctg tctcagaaaa aaaaaaaaaa ataggttttc agtctgggta 123180

ccggtggctc acacctgtaa tcccagcact ttgggaggcc aaggcaggca gatcacttga 123240

ggtcaggagt ttgagaactg cctggccaac atagtgaaac cttgtctcta ctagaaacta 123300

caaaaaatta actgggcatt ttgacgggtg cctataatcc cagctactag ggaggctgag 123360

gcaggagaat tgcttgaacc cgggaggcag aggactgcat ctcaaaaaaa aaaaaaaaaa 123420

aaaggtttcc agtccccctg tctcagaaat tctgattctg caggtttgag gtgtgaccag 123480

gaatctttat ttttagaaga cataccagat aattctgata aatagccagt ttagggatgt 123540

agtctaattt tcctattttg caagtaagga aaataaggcc cagagaggta atgatttttct 123600

caaagtcaca gaacaagtta gtggcagaat ttggactgga atgcagttct taatgttctg 123660

tccagtgttt attctggtac agtatgtttg tagaaggtat tacgtaagaa acattgttat 123720

atagatgttg agataggaag agtttacatt tagaaatttg gtctaaaatg cctgaacatt 123780

caagtcgtgg aggagtattg accaacttac tcaatacaac ataggagatt cacattttgt 123840

tacaaaaatg ctgatttaaa aggagagttt tctttttttt cttctttttt attttttgag 123900

atggagtctt gctctgtcac ccaggctaga gtgcagtgac acgatctcag ctcactgcaa 123960

cctccacctc ctgggttcaa gcggttctcc tgcctcagcc tcctgagtag ctgggattac 124020

aggtgggggc caccacgccc agctaatttt tgtattttta gtagagacag ggtttcacca 124080

tgttggccag gccggtcttg aactcctgac ctcaagtgat ccacccacca ctgcctccca 124140

aagtgctggg attataggcg tgagccactg tgcccagcct gcttgttttt gtatcatata 124200

tatgcatcat cataatcatg cattatcaac ctttgtattt ctgtcaggac atagaaacca 124260

ttagagtgct tggaagagag cctttttttt tttctcgcat ttaatgcttt ttttggtatt 124320

catttcataa tcagcttacc aaaacattac ctgcattata ccccatcaag gtagaaatct 124380

ttgtgttatc aatattggtt actcccttc cacaccgagt catcagtaag tcctgttcta 124440

tccaaatagg tcatatgcat ctagctcacc cctcagtgct gttttgtttt gaatttgtac 124500

atgtttactc ctgatgcctt gtagttatga tgatgtgttc ttatttttatt ctgtgcatac 124560

aagttctcag ctcgcttttt agggaaaatg accatgtctt cctttcctat aaattccttt 124620

ctatctatca agtcctcaac agagaatagg tacccataaa tatgtgattg ttagtttctt 124680

tgcctcagtt gtagtctgat ccttacagct tttaaacaac agtagagttc accgtcaaga 124740

actaaggatg gttggcaggc agatagaaag gtagcaagtt gacccaacta tctctgggga 124800

agtgggaaca aagaaaggtt acatcagcac tgtcatcaca tagctctata gttctaggcc 124860

tgcaggctca atcaagtagc cttgtataag attctctgga ggaggtgctg aaagttgctt 124920

atacttgcta tggaatttga ttttacttcg gatatctttt taccataggt acttctccct 124980

ccaagccaca catcctcttg gatttgatga tgttgtacga ttagaaattg aatccaatat 125040

ctgcagggaa ggtgggccac tccccaactg tttcacaact ccattacgtc aggcctggac 125100

aaccatggag aaggtaaccc agaacttcaa acgtatcaaa ctacaagaag ttttattggt 125160

agaactcata aaatataagg tgggaaaacc aagcagaata gcacagtgga aattgaagca 125220

gtccagcaaa gtgattaaga gcagaggcct tgagtctggc ctggtatgta cagtcacgtg 125280

ccacataaca ttttagtcaa cagtggactg cgtgtacgat ggtcctgtac gattataatg 125340

-continued

gatcaaagct ggtagtgcaa taataacaaa agttagaaaa aataaatttt aataagtaaa 125400

aaagaaaaaa gaaaaactaa aaagataaaa gaataaccaa gaacaaaaca aaaaaaatta 125460

taatggagct gaaaaatctc tgttgcctca tatttactgt actatacttt taatcattat 125520

tttagagtgc tccttctact tactaagaaa acagttaact gtaaaacagc ttcagacagg 125580

tccttcagga ggtttccaga aggaggcatt gttatcaaag gagatgacgg ctccatgcgt 125640

gttactgccc ctgaagacct tccagtggga caagatgtgg aggtgaaaga aagtgttatt 125700

gatgatcctg accctgtgta ggcttaggct aatgtgggtg tttgtcttag tttttaacaa 125760

acaaatttaa aaagaaaaaa aaaattaaaa atagaaaaaa gcttataaaa taaggatata 125820

atgaaaatat ttttgtacag ctgtatatgt ttgtgtttta agctgttatg acaacagagt 125880

caaaaagcta aaaaaagtaa aacagttaaa aagttacagt aagctaattt attattaaag 125940

aaaaaaattt taaataaatt tagtgtagcc taagtgtaca gtgtaagtct acagtagtgt 126000

acaataatgt gctaggcctt cacattcact taccactcac tcgctgactc acccagagca 126060

acttccagtc ttgcaagctc cattcatggt aagtgcccta tacagatgta ccatttttta 126120

tcttttatac tgtattttta ctgtgccttt tctgtatttg tgtttaaata cacaaattct 126180

taccattgca atagtggcct acgatattca ttatagtaac atgtgataca ggtttgtagc 126240

ccaaaagcaa taggttgtac catatagcca aggggtgtag taggccatac catctaggtt 126300

tgtataagta cactctgtga tgttagcaca atggcaagca gcctaacgga aattctgttt 126360

attgattgat tgattgattg attgattgag acagagtttc actccattgt ccaggctgga 126420

gtgcagttgc acagtcttgg cacactgcaa cttctgcctc ccaggttcaa ccaattatcc 126480

tgcctcatcc tcccaagtag ctgggattac aggcaggcac caccatacct ggctaatttt 126540

tgtattttag tagagacagg gtttcaccat tttggccagg ctgttctcga actcctgacc 126600

ttaagtgatc tgcctgcttt ggcctccgaa agtgctggga ttacaggcat gagctaccat 126660

gcctgggcag taactgaaat tctctaatgc cattttcctt atctgtaaag tgacgataat 126720

atgcacgttt acctcaaagt tactttgatg attaaagtaa ggtaatgtat ataaaataca 126780

tattaacata gtacctgaca catggtaagc atcaaaaaat gttaactact tttattacta 126840

ttattattac gtatttttaa ataattagag agcagtatca aaaattagct gggcgtagtg 126900

gcatgcacct atagttccag ctactcagga ggctgaagct ggaggattgc atgagcctgg 126960

gaattaaagg ctgcagtgag ccgtgttcat gcccctgcac tccagccttg gtgacagagc 127020

aagaccctgt cttgaacaat taaagaaggc attatgccgc aacgttagct tagaaatgat 127080

ccacatatat caccagtaac tgtcaacagg attggaaccc tagttttggg tattatgatc 127140

acaaggtatt attaatagct tattaataat aaagcgttgg ctaggcacgg cgactcacat 127200

ctgtaatccc agcactttgg gaggccgagg tgggtggatc acctgaggtc aggagtttga 127260

gaccagcctg accaacatgg agaaacccca tctctactaa aaatacaaaa ttagccgggc 127320

gtggtggtgc atgcctgtaa tcccagctac ttaggaggct gaggcaggaa aatctcttga 127380

acccgggagg cagaggttgc agtgagctga gatcgcacca ttgcactcca gcctgggcaa 127440

caagagcaaa actccgtctc aaaaatataa ttataataaa taaataaaag taaagtattg 127500

atgtttgtga atgatttatt cttctaatga actagaggag atttttccag gaatttcaga 127560

gccagtgagg ttatgttgct tgtatgtgtc atgtgtatcc aggtgaaaaa acttaattaa 127620

-continued

acgctattat ataataccat acataaaaac tgaattttag gaatactgaa gaatgacata 127680

tagaagtcaa atcattaaat agctagtagt aaacagaata gagtgtcagc tgttacccaa 127740

tgatgataat attttcacga ttaaaattaa acctttctg attttaaagg aaaagttcag 127800

atctgtatca tataaagaat gtaaattttc agggtaataa aattaaaatg cagagagaaa 127860

aatgcaaaaa tagttcttac tagatgtgtg tatgtaagga acttagacta attttaagaa 127920

cactgtcaag accctggtag ttaggtagga aaaaagacat gaatgattca ttcaacaaaa 127980

actttgagta tttctgtgct agatggtagt gttacagtgg taaacaaaat aaatgtgttt 128040

ctgctatcct ggagcttagt ctacaaaaaa ggtacatatt ggccgggcac ggtggctcac 128100

gcctgtaatc ctagcacttt ggaagatcga ggcgggtgga tcacctgagg tcaggagttc 128160

aagaccagct tggccaacat ggcgaaaccc cgtctctact aaaaatacaa aaattaactg 128220

ggtgtggtgg cggacacctg taatcccagc tactcgggag gctgaggcag gagaatcact 128280

tgaacctggg agacagaggt tccagtgagt cgagatcatg ccactgcatt ccagcccggg 128340

ggacaaaagc gaaaatacgt ctcaaaaaaa caaaaacaaa caacaaaggc acgtattaaa 128400

tacgaacata aatatttaca aattatactg aataagttct catgtttatt atttgcttgt 128460

ccagttacaa acttttcctt cgtagaatta gaaatataaa taataaacat gagaactcat 128520

tcagtataat taataattat taaatgtaaa taaaaacatc tatgtacaat taggcattta 128580

tttaagaatt atttgaaaaa aaaacaatgt ggaaacagat attttgatat attgctagtg 128640

attgaaattg ataatgttct tttgaagagt aaagtgacca tatatattaa agttaaaatt 128700

taactcagca atcacacgcc tggtgagtta tcttaaggaa atcagtttga aagtaaaatc 128760

aatatatgca caaagacttt aacatttatc ataaaccaga aaaatcgagt ttcaaattat 128820

atcctatgga ctattttctg ctaaaaagta ttaatatcaa ctttatgtaa tactttcgtg 128880

acaaatattt tgggggagaa aacccaacaa aattacatgc attgtaattt ttttttttt 128940

ttttttttta gacagtcttg ctccagcgtc caggctggag tgcagtggtg caatctcggc 129000

tcactgcaac ctccatctcc caggttcaag caattctcct gcctcaggcc tcccgagtag 129060

ctgggattac aggcgctcac caccatgcct agctaatttt tatagttttt agtagagatg 129120

gggtttcatc atgttggcca ggctggtctt gaactcctgg tctcaagtga tccgtctgcc 129180

tcggcctcct agagtgctga gattacaggt gtaagccact gcacccagcc ttatgcatta 129240

taattttaat ttgtaaactg tacaaaggga taatacttgt agtacaacaa gaagtaaaaa 129300

catttgttat aggtagttaa catttgtaac cagtagaatt ataggtaaaa tttatttatt 129360

taaaacagtt ttagttggat ttgatttcaa ctttaaaata atgcttttca tctctatcag 129420

gtctttttgc ctggcttttt gtccagcaat ctttattata aatatttgaa tgatctcatc 129480

cattcggttc gaggagatga atttctgggc gggaacgtgt cgctgactgc tcctggctct 129540

gttggcccta ctgatgagtc tcacccaggg agttctgaca gctctgcgtc tcaggtattg 129600

actgattgcg tctgccatta gggagaaaag catacacatc ctttccttca catcccagta 129660

acagatccta ttatttgtaa attttaagtt gtggaaaaaa aagataaaag ccaggcacag 129720

tggcctgtgc ctgtaatccc agcactttgg gaggctgcgg tgggcggatc acacgaggtc 129780

aggaattcga gaccagcctg gccgacatgg tgaaacccca tctctactaa aaatacaaaa 129840

attagccggg catggtggca ggcacctgta atcctagcta cttgggaggc tgaggcagga 129900

-continued

gaatcgcttg aacccaggag gcagaggttg caatgaacca aaatcacgcc actgcactcc 129960

agcctgggtg acaaagtgag actgtgtctc aaaaaaaaaa aaaaaagaga gaaataaaat 130020

tagcctactt actatcttct aatcaaagca tttgtggtaa cttaaaatat actgtattgt 130080

aaagtatcat gctgtttcat ttaggccatt attctatttg aatctgtggc tgtttctctt 130140

aataaatcaa gtaatatgga atatattcat agcctctgaa gagctcttta tgtaagtatt 130200

tatttaggat acttttttgta aaataagtga atgaattctt aggtctcctt ttttttttctt 130260

ttcttgagac agggtctcct cgctgcaacc tggaaattct gggctcaaat aatccaccca 130320

ccacagcctc ctgaatagct gggactagag gcatgcacca ccacgcctgg ctaatttgaa 130380

atttttttttt ggccaggcat gatggttcac gcctgtaatc ccagcacttt gggagaccga 130440

ggcaggcaga tcacgaggtc gggagatgga gaccagcctg gccaacgtgg tgaaaccccg 130500

tctctactaa aaatacaaaa attagctggt tatggtggct catgcctgta atcccagcta 130560

cttgggaggc tgaggcagga gaatggcttc aacccagggag tcggaggttg cagtgagccg 130620

agatcacgcc actgcactcc tgcatggtga cagagtgaga ctccatctca aaaaaaattt 130680

ttttttaaa tgatggagtc ttgctgtgtt gctcaggctg gtcttgaacc cctgacctca 130740

aatgccgcct gcttcagcct aagtttcttt ttttttgta aagagacagg gtcttgctat 130800

gttggccagg gtagtctcaa actcctggct tcaagcagtc ctcccacctt ggcctctcaa 130860

agtgctggga ttacaggcgt gaaccactac ctataatgtt gtgtttcact caaggccttt 130920

tgatttcgtt ttgcattacc gtgccacatt gtgcatttcc ttgacctttt ttgggttttt 130980

tggagtgctt tcatatgtta aaccatacct gattctcctc aaaatcacac aaagtagaat 131040

atcctaagac aagaaatcta aggaggcata aagaagttaa ctggttttat taaactcaca 131100

cagtaaatga tagagccaga aatattcccc ttctagtgtt cttcaccatc agcttaatgt 131160

agcataataa ttttctaatt actgttgaca aataaataac cctttgaatt ttcaatactg 131220

ggccttggat aaattttcct aatttgtaag agagtattat cgtattgcca tttacaaagc 131280

tctcctgagt atctttttct tctgttaagt ttacctagga gataaactgc tgagtatggt 131340

tgccattttg gttttttgat ataggttaga atgtcttggt ttttttttttt ttttttttttg 131400

gtttttgttg ttgtcattgt ttgagacagc atcttgctct gtcgcccagg ctggagtgca 131460

atggcacgat cgtggctcac tgcaacctcc acctcccggg ttcaagcaat tctcctgcct 131520

cagcttcctg agtagctggg attacaggca tgtgcaacca cacctggcta atttttgtgt 131580

ttttagtaga gaaggggttt caccatgttg gtcaggctgg tattgaactg ctgacctcat 131640

gatccacctg cctcggcctc ccaaagtgct gggattgcag gcatgagcca ctgcacctgg 131700

ctgaatgtct tgtttttgat taggcactta agaaaggcct aggtactaac cataaaatat 131760

atttttatac cttttgttga tactatatat atagaaaact gcacttatca taaccttaga 131820

caccttgaag aatgttcaca agcagaacta acccatgtga cccagcatcc agatcaaaaa 131880

cagcattatc agcccctcta gaagccctct tgggcccctt ccattcactg tccttcttgt 131940

caccagggta gctactatcc tgacttttga tggcatagat tagcattacc tgttcttgtc 132000

attttataaa taaaaccata ctgtgtattc ttttcttgta cagctttatt gtgctaattc 132060

acatttacat catacaattc agtggttttt atatggtcac agagttaggt aaccattacc 132120

acatcgattt tagaacattt ttttcactcc agatagaaac ccccttttact taaactccaa 132180

-continued

atcccccact ccaccagccc taggcagcca ctagtctact ttttatctct atagagacaa 132240

tagatttgct tattctggac atttcataaa catggaaccg tatattatgt ggtcttttgt 132300

tgccaactgt ctttcactta gcatcatgtg ttcaaaagag catcatgtta tccatgtttg 132360

gcatgtatca gaatttttatt cctcattatg gccaaatatc ccattgcaag gatttatgac 132420

attttatttg aattgtaccc tcctttctgc catttatcaa taatgctact gtgaccattt 132480

gtgtacaagt ttttgtgtgg atacaggttt tctttttgtt tttaaatttg aggtggagtc 132540

ttgctctgtc gcccaggctg gagtgcagtg gcacaatctc ggctcactgc aacctctgtc 132600

tcctgggttc aagcagttct cctgcctcag cctcccgagt atctgggact ataggcacgc 132660

accaccacgc ccagctaatt ttttagtaga gatggggttt caccatgttg gccagtctgg 132720

tctcgaactc ttgacctcaa gtgatccacc catctcggcc tcccaaagtg ctgggattac 132780

aggggtgagc cactatgccc ggctgtggtt ttcatttctt ttgttgtata tacataggag 132840

tagaattgct gagtcaagag gtaactctta aacttattga aaaactgcca gattgttttc 132900

cgaaaaggct gcaccatttt gcaatcccac cagcagtgta tgagttttac agcttctcca 132960

catttcattg gaacttatta tctgtttggc tgtttttaaa aatgatagtc attccaataa 133020

gttctacttc agtgtggttt ttgcacttct ctgatgagta atgatgttga gcatcttttc 133080

atttgcttat tggcctttgt tctagctttg gaaaaatgtt tattcaaatc ctttggccat 133140

ttttatttttt atttttattt atttattttt ttttgagacc aagtctcact ctgtcagcca 133200

ggctggagta caatggtgtg gtctcagctc actgcaacct ccgcctcctg tgttcaagtg 133260

attctcctgc ctcagcctcc cgagtagctg ggattacatt tcaggcacct gccagcatgc 133320

cgggctgatt tttgtatttt tactagtgac agggtttcac catgttagcc aggctggtca 133380

caaactcctg acctcaggtg atctgcctgc ctaggcttcc caaagtgctg ggattacagg 133440

cgtgagccat tgggcccagc ctagattttc ttttttcttt ttttttttga gaaggagtct 133500

tgctcttgtt gcccaggctg gagtgcaatg gcacaatctt ggctcactgc aacctctgcc 133560

tcctgggttc aagcgatttt cctgcctcag cctccccagt agctgggatt acaggtgcct 133620

accaccacac ccagctaact tttgtatttt ttttagagac agggtttcac catgttggcc 133680

aggctggtct caactcctga cctcaggtga tccacctgcc ttggcctccc gaagtgctgg 133740

gattaccggc atgagctacc aggcccagcc aattttctca ttatattgcc caggctggtc 133800

tcaaactcct gggttcaagt gatcctcctg ccttggcctc ccaaagtgtg gggagtacag 133860

gcgtgagcca ccttgctcag ccccttgcc catttttaaa ttagattgcc tttttatatt 133920

gagtttcagg agtcctttat atattctaga taaatgtccc ttatcaaatt atattatttc 133980

caggtatttt cttcattctg tgagttgtct ttcctctacc ttttaaaaaa ggtgggtttt 134040

tgtttgtttg tttgtttgtt tttttaagat aaggtctcat tctgctgccc aggctggagt 134100

gcagtggcac aatcacagct cactgccacc tcaacttcct gggccgaagt gatcctctta 134160

cttcagcctc ctgaatagct agggccatag atacacacta tcacacccag cttttttttt 134220

ctgtttgtag agacagatct tactgtgttg cccaagttgg tctcaaactc taggctcaaa 134280

gtgattctcc cacctctgcc tcccagagtg ctgggattac aggtgtgagc cacacgcaac 134340

ctgtcttttc actattaata gtgtcttcct gcttcagcct cccgagtagc tgggattaca 134400

ggcacccacc accatgcctg gctaattttt ttgcattttt agtagagaca gtgtttcacc 134460

-continued

atgttcaccc ggctggtctt gaactcctga cctcaggtga ttcacctgcc atggcctccc 134520

aaagtgctgg gattacaggc gtgagccact gcacccggcc aaaatattgc cttcttaaca 134580

gtattgtctt ctaatttgtg aacatggatg tatcttcatg tatttatgtg ttctttcatt 134640

tcagcagaat tttgtagttt tcagagtaga agcctttcac ctccttgggt catttattcc 134700

tatgttttaa gttcttttcg attccattat aaatagaatt gttttcttaa tttcattttc 134760

agattgtttg atgagagagc atagaaatac aagtgatttt tacatgttga tcttgcaact 134820

tcaactttga taaatctgat tgttagctct aatagttttc ttgtggattc tttaggattt 134880

tcaatatata agatcatgtc atttatggat agagatagtt ttttttctgg ctagaactta 134940

cagagcaatg atgagtagaa gtggcagaag caaaaatctt tgtcttgttt cctatctgac 135000

agggaaagct ttcagtttca tcatttaata tgatgttagg tgtgggtttt caataaatgc 135060

ctttttcag attcaggaat ttccctatca ttcctgattt tttaaggctt tttttttttt 135120

ttaaatcatg aaagggtgtt gaatattgtc atgttctttc tgtatcagta taaatgatcc 135180

tatggatttt gggttttatt ctgttgatgt gaaatattaa ttgattttca gatgttaaac 135240

caaccttgca tacctgagat gaatctcact tggtcatggt gtataatctt ttcaatatgc 135300

tgctggattc catttactgg tattttgttg aagattttgt atctgaacgc ttaagataac 135360

atttacactc tatcagaaat gaattgacca taaatgtgag agtgtatttg tgggttcttg 135420

attctcttcc attccaaaga tagacataca tccgtctgta tgtctgtctt tatgccagta 135480

ccatactctc ttgattacta ttgctttgta ataagttttg aaatcagaaa gtataaatga 135540

gattttggta tctgagtaac agtcctcata gaattagttg ggaaatattc cctctttatt 135600

ctggtccctc tttctttttt gtttaactgt gtatcttgga gattgttcct tctcaacaca 135660

tgagagccgc tttccctacc ctcccacccc tgctatagag aggtctataa gtgtctgttc 135720

aattatttta tttacttaac ctattactta gtcggggaca ttaagcttgt ttatgtcttt 135780

tattttaaac aatgctgcag tgaataatct tgtatataag tcattttcca tcaatataag 135840

tctctctgta actgaatttt tagaagtgga atttctaggt caacctatgg ctctgtattt 135900

cacaaaaata ccaattctgg tttttcttgt ggaggtgggg agtaggaggt agaatgctgg 135960

aggagaactt gctgtactca gctggctagt cattttagaa aggtttcctt agcttctttt 136020

tgtcatatgg cctcaccaag aatcaaaaac attcctattt accctgtaaa catggggctt 136080

tactacccaa gatacatatt tctggatgta tgacagcttt tcatattgaa gaaataatgc 136140

tgtgagtaca gcacatttgt tggaacttag gtcgttaaga atgtcttata aattcataca 136200

ttatacattt tattttattt tatttttag tttttgatac agagtcttcc tctgtcgccc 136260

aggccagcgt gcagtggtac aatcttggct cactgcgacc tccatctcct gggctcaagt 136320

gattctcatg tctcagcctc cagagtagct atggttacag gcatgcacca ccatgcccgg 136380

ctaatttttt tatttttagt agaaactggg tttcaccata ttgaccatgc tggcctcgaa 136440

ctcttggcct caagtgatcg gcctgcctca gcctcccaaa gtgctgggat ccttgtattg 136500

ggtaaaagat gaatattgag ggctgcatgg tggctcatac ctgtaatccc agcactttct 136560

gagactgagg tgggaggagt cctggagccc aggagggtga ggctgcagtg agttgtgatc 136620

gcgccattgc acttcaacct aggaattata ggcttcagtc actgtgcccg gcatgtacat 136680

tttaatattg tgctttcctc ttttagctat agtatgaggt tacatttcag agtcattgtt 136740

-continued

gttaagcatc ttaatagtga tgaggttgag tgaaagttac ttctatttca aacactgaag 136800

aaaattttgt acaaatctgt cacattccaa gcccaggact gattgtttca tatacttcta 136860

attttacaat ttctattgta gtccagtgtg aaaaaagcca gtattaaaat actgaaaaat 136920

tttgatgaag cgataattgt ggatgcggca agtctggatc cagaatcttt atatcaacgg 136980

acatatgccg ggtaagctta gctcatgcct agaattttta caagtgtaaa taactttgca 137040

tcttttaaat tttttaatta aattttacat ttttttctaa tctattatta tatgcccaga 137100

actttcactt agagtgtgca gtataatgtg gtggttaagt ataaaggctc tggagtgact 137160

tcctgggttt taatcttggc tctgccattt attggcagcc gctaacctct tggtatctca 137220

gtttcttcat ctgtaaaatg agaataataa agtgaaaaga tgccaacatc atttactctg 137280

ggctgcataa ctgatacttg gaaaaagtat tcctttgagt ttaagaatta agttggttat 137340

tcattttagc ttgtaataaa aagatagtga ttcataggat atgccactta ctgaaattta 137400

ccacagatcc aatcataaaa tcactttctc ttccctaaag atagcttgat taacatgtaa 137460

aggtgtgtaa aggcttgatt acactaccct gatccgtacc ccagttccca gcagcaccat 137520

gaaaaaggga tttcaacata tttaattact ttcagtagaa agtaacagtg gtaggccagg 137580

cgcagtggct cacacctgta atcccagcac tttgggaggc cgaggtgggc ggatcacgag 137640

gtcaggagat tgagaccatc ctggctaaca cgatgaaacc ccgtctctac taaaaataca 137700

aaaaattagc cgggcatggt ggcaggcacc tgtagtccca gctacttggg aggctgagac 137760

aggagaatgg cgtgagcccg ggaggcggag cttgcagtga gcttagattg tgccactgca 137820

ctccagcctg cgcagtggag cgagactctt gtctcaaaaa aaaagaaagt aacagtggta 137880

ttgggagact gaggagccta gaaagtactt gaaggaagta aaaggtttgt ttgaccacat 137940

tgtatttgga aagccagctt tttcagctgt gtcagctttg tgtagtgatt tttagttctt 138000

cttttagaaa ataacggaca aggccgggca cggtggctca cgcctgtaat cccaccactt 138060

tgggaggccg agacgggcgg attacctgat ctcaggagtt cgagaccagc ctgggcaaca 138120

tggtgaaacc ccgtctctac taaaatacaa aaagttagcc gggcgtggtg gcgtgtgcct 138180

gtagtcccag ctactccgga ggctgaggca ggagaattgc ttgaacccgg gaggcggagg 138240

ttgcagtgag ccaagatcac accattgcac tgcagcctgc gcgacagagt aagactctgt 138300

ctcaaaaaat aataataaaa taaaaaagaa tggacagtaa acctaaatga gttcattccc 138360

aaagatgatg ttattcttaa gggatggttc atttatttaa gaccttacat aaagtctatc 138420

aattgcgtga tttttcactt ctgtaattgt gtgtatgtat aatgtaaata tatatgtttt 138480

tgttttgttt tggttttttg agacggagtc tcgctctgtt gctcaggctg gaatgcagtg 138540

gtgcaatctc agctctctgc aacctctgtc tcccaggttc aagcgtttct tctgcctcat 138600

cctcccaagt agctgggact acaggcacgt gccaccacgc ccggctaatt ttttgtattt 138660

ttagtagaga tggggtttca ccgtgttagc caggatggtc tcaatctcct gacctcgtga 138720

tccacccgcc ttggcttccc aaagtgttgc tattacaggc atgagccacc acacccagca 138780

tgtatttttt aaatgtataa aatgaagcag aaaagagaaa tgataatttt tcttcatctt 138840

gaaagattat cttcaccagg cgcagtggct cacacttgta atcccagcac tttgggaggc 138900

ctcggcaggc ggctcacttg agttcgaaac cagcctggcc gacatggtga aactccgtct 138960

ctactaaaaa taaataaata aagatggttt taatatatgt tttagtttta tgattttagc 139020

-continued

atctttctga aatttttctc aaggcaagta aatttgtatc agttggtata ttggtaccca 139080

tctatgaaat aacttattag gaagatatct ctaaaataag atcactttgc ctaaaataaa 139140

ctgatatatt gatgttcaca gaatttttct tttaaccgac ttgataaatg cattattctt 139200

gacgtcaagt gatccacctt cctcagcctc ccaaagtgct gggattacac acatgagcca 139260

ccgcacctgg cattattctt ataaaaggtt aaatttctag ttaagtttaa tgtcctcttt 139320

gttcatgtac cattgcttat tttcttccct tcctactcac agtaatcatt cttatggtat 139380

gcacttttgt ttgcttattt ttatgtaatt gatattacgc tccattctgt acgttgtact 139440

ttcattcaca gtgagttttg gacattccta tgttcatcta tacagactta cttcatttta 139500

actacactgt agtattccgt atgtaatatt tactataact catcactgta gcagagcatc 139560

tcatagtgta tgtattactg ttttgccatt ttggtatcaa tgagtattta agtcatttgc 139620

agtttttccc tcttataccc agtattacag aggatctctt tttatatgct tctttgtacc 139680

aagaggcaga ttaaaaaatt tttttttgaa aaaatttttg aaaaaaaatg aaatgaagtc 139740

tcactatgtt gcccaggctg gtctcaaact cctaggctca agcaatcctt ccatcttggc 139800

ctcccaaagt gctggggtta caggcatgag ccaccatgcc tggcctacat tttaaatttt 139860

gatagctctt acaatttact ttgtaaagta tctgcatcat tttatgttct caccagtctt 139920

taataagaat acttcatact tttggctgga cacagtggct cacgcctgta atcccagcac 139980

tttgggaggc cgaggcgggc agatcaagag atcgagacca ccctggccaa tatggtgaaa 140040

ccctgtctct actaaaaata caaaaattag ctgggcgtgg tggcgcaccc gtagtcccag 140100

ctactcgaga ggctgagaca ggagaatcac ttgaacccgg gaggtggagg ttgcagtgaa 140160

cttagatcac accactgcac tccagcctag caacagagtg agactctgtc tcaaaaaaaa 140220

aaaagaatac ttcagactta attttttttc cagtcttaag tgtttgctaa tgagattgag 140280

tttcttttgg tatgtctctt gattgttcag gtttttttctt ttatgaattg actgttcatc 140340

tctttttcac attatttctg ttgggtgatt ttattagtga cttgttaaaa ttctgtatat 140400

tttttcagca tgacacttca ttattcaaaa aaaaaaaaag attctctatg tttctcgata 140460

ctaatcattg gttggtaata ccttaaaaat aagaccctta ctgtattttt tgcttttttt 140520

ttttttttt ttttttttt tttgagatag agtcttgctc tgttgcccag gctggagtgc 140580

aatggtatga tctcggctct cagctcactg caactgcaac ctctacctcc ctgtttcaag 140640

caattctcct gccttagcct cccaagtagc tgggattaca ggcatccacc accacaccca 140700

gctaattttt gtatttttag tagagacagg gtttcaccat gttggccagg ctggtctcaa 140760

actactggcc tcaagtgatc cgcctgcctc ggcatcccaa agtactggga ttacaggcat 140820

gagccacagt gcctagccac tttttgcttt ttaactttgt tttatagtac tatagtttta 140880

gtataaacag atgtatgtat acacacaact atggctttat aatatgtttc agtcattgtt 140940

agagcaaggc ctacctttg ggtgcttctt ttacaaaatt gtcttggcta ttcttgtgcc 141000

ttttttctta tttgtgaatt ttagaattgt gaattacctg ttgactcacc atgttttgta 141060

aactgaggat tttgaatgga attgcactca attaaagatt atcttgcttt ctgtgcagca 141120

atgttttatt tcaaataatc cctactttaa attacttagg atagctataa attgtgtttc 141180

tggctttcta gatttagatg aaacgcttta aattgattgt tttctcctaa atttaaaact 141240

gattgttaga agttaaagtc ttctgttcat tcttatttag gaagatgaca tttggaagag 141300

-continued

tcagtgactt ggggcaattc atccgagaat ctgagcctga acctgatgta aggaaatcaa 141360

aaggtttgtg gtgtttttat acttcatatt aagcctttac tcacattagt gattgactgt 141420

aagtcaaaga ccacttaagg tttaaactgt ttattttgta aagtaaccac tgtatctttc 141480

accttgtgtt tatagtcaga agtaagtaca agggcttcct gtagtcacat ctttatgcaa 141540

tctcctctga atcaaaagtt agtgaacttg ctttgccact ccagaaggca catgaatatg 141600

aaaaagcatt gtctattttc ttatttaatg gcaaaatacc cgacctaagt tggacttaat 141660

gtttgagacc gtttatttta ttaaattata ttttttctct tttcttttt ttttttgaga 141720

cagttcttgc tctgtcaccc agaccggagt gcagtggtct gaccgcacct cactgcaacc 141780

tctgcttcct aggttcaagc gattttcctg cctcatcctc ctgagtagct gggactacaa 141840

gtgcgcacca ccacacctgg ctaatttttg tatttttagc agagatgagg tttcaccacg 141900

ttggctaggc tggtctcata ctcctgacct caagcaatcc atccgccttg gcttcccaaa 141960

gtgctgggat tacaagtgtg agccaccatg cctggcctta ttaaattatt tttattaaat 142020

ttcctcaaga ttgatgaaag taatgaaata taaaagtaat gaaatatatg tggaaaatag 142080

actggattaa gaaaatgtgg cacatataca ccatggatac tatgcagcca taaaaaagga 142140

tgagttcatg tcctttgtag ggacatggat gaagctggaa accatcattc tgagcaaact 142200

gtctcaagga tagaaaacca aacaccgcat gctctcactc ataggtggga attgaacaat 142260

gagaacactt ggacacaggg tggggaacat cacacgctgg ggcctgtcgt ggggtggggg 142320

gctgggggag gaatagcatt aggagatata cctaatataa atgacgagtt aatgggtgca 142380

gcacaccaac atggtacatg tatacatatg taacaaagct gcacgttgtg cacatgtacc 142440

ctagaactta aagtataata aatttaaaaa aaataaatat atgtggaaaa tattaatagg 142500

tcaaaattca aattgttcat ttaatcagaa gagtagttta gtcaaatcca agggttagac 142560

aacagaaatc ttttttgtca agtgcattct ttgtgactga tttcattttc ttcctggttt 142620

acacaggaag atttcagaaa caaatgtgga tccgtgacag atggtatcta gaagttttta 142680

gtttggttga attgacagta ttttattgag taaaagatac taatttttgt aagaagaaaa 142740

attcaatttt gataagtatg tttaagatta agagctattg gccaggcgct gtggctcatg 142800

cctgtaatcc tagcactttg ggaagctgga gcaggtgggt cacgaggtca agagattgag 142860

accatcctgg ccaacatggt gaaaccctgt ctctactaaa ttagccaggc gtggtggcac 142920

atgcctgtgc acccgcctcc gggtttaagc gatcctactg cctcaggctc ctgagtagct 142980

gggattacag gcgccatggc taatttttgc attttagta gagacagggt ttcactacat 143040

tggccaggct ggtctggtct caaactcctg acctcaggtg atctgcccgc cttagcctcc 143100

caaagtgctg ggattacagg catgattcac catgtctggc catttatctt attttctttt 143160

ttttttttt ttttgtttga gacggagtct tgctgtgtcg cccagagctg gagtgcaatg 143220

gtgcgatctc agctcactgc aacctctgcc tcctgggttc aagcaattct cctgcctcag 143280

tcttccaagt agctgggatt acaggcgcgt gccaccacat ctagctaatt tttgtatttt 143340

tagtagagac agggtttcac catgttggcc aggctggtct cggaactcct gacctcgtaa 143400

tctgcccacc tcggcctccc aaagtgctga gattacaagt gtgagccact gtgcccagcc 143460

atcttatttt ctttctttt ttttgtcggg tgggaggggg acagagtcta gctctgtcgc 143520

caggcttggc tcactgcaac ctctgccccc caggttctag caattattct gcctcagcct 143580

-continued

cccaagtagc tgggattata ggcacctgcc accacgcctg gctaattttt tgttattttt 143640

agtagagatg gggttttgct atgttgacca tgctggcctc aagtgatccg cccaccttgg 143700

cctcccaaag tactgggctt acaggcgtga gcttgtattg ggtaaaagaa caatattggg 143760

ggctgcatgg tggttcatac ctgtaatctg agcactttgt gagactgaga tggaaggagt 143820

gttggagccc aggagggtga ggctgcggct gcagtgaatt gtgatcacgc cattgcactt 143880

ccacctaggt aatggagcaa gaccatgtct ctaaaaaaca aaacacaatt tttttaagga 143940

atactgggaa gaggtcagtg gtggttttag aacagaggaa gtgccagatg acctttgtga 144000

ggcattggcc aggaagaact ctacagtgtc tttaggtagc ttctgtccat aaggataatg 144060

gggtctcctc cccagtatta atagaaaatc tctgagctgt tttttttgt ttgtttgttt 144120

tgttttttt tcctgagatg gagtctctct ctgtcggcca ggctggagtg ctgtggcgcg 144180

atcttggctc actgcaagct ctgcctccca ggttcacacc attctcctgc ctcagcctcc 144240

caagtagctg ggactacagg tgtccaccac cacgcccagc taatttttg ttatttttag 144300

tagagatggg gtttcaccat gtcagccagg atggtctcga tctcctgacc tcgtgatccg 144360

ctcgcctctg ccttgcaaag tgctggagtt acaggcgtga gccaccgtgc ctggcctggt 144420

ttttttgttg ttgttattta tttatttatt tatttatttt ttgagacaga ctctcgctct 144480

gtcgcccggg ctggagtgta gtggcacgat gtcggctcac tgcaagctct gcctgccagg 144540

ttcaagccat tctcctgcct cagcctcctg agtagcaggg accacaggcg ctcgccacca 144600

cgcccggcta atttttttgta tttttagaag agacggggtt tcaccgcatt agccaggatg 144660

gtctcgatct cctgatgtcg tgatccgccc acctcggcct cccaaagtgc tgggattaca 144720

ggtgtgagcc accgtgcctg gcctgatttt tttttttttt taatctggtc tcatacctct 144780

gacagctcat gaagaagtgc tcctgcttca tatgtatatg tgttagcata gtgttaacat 144840

agcataggtg ttcggtgttt gcagtttctg tttgttttat atgaattaag gtgtattatg 144900

agcagttgaa gatatatagg aaatttttc ccaaaccact atctctgctc gttctattca 144960

ttcagtctgt ttatgttatt ccttcattca ttcattttat agaacagtgg agtgcctact 145020

gtatgcatct attgttctgg gtcctgggga agaaaacaaa gttcctgctt tcatggaact 145080

tacattatat tggcggagac agtaacagac aaacaaatgt agcctgtgta catgtgttac 145140

atgaaaagca gggtaggggg ctgggagaga gtagtaggga gtgctatttt cgaggtggtt 145200

gtcaggaaag gcctcactga ggaggtggca ttttgagtag acctgagcgc agcgggggcg 145260

taagcccagg cagcatgtgg aggaagagtg ttcttggtga aaggaacaag gatagaggcc 145320

cgaagctaga gagctcagca tgatcaagga acagcaagcc ccgtgtggct ggaatggagt 145380

gagcaaagga atgagcagta gaaggtgagt gagttgggag gtcaccagag accatggcaa 145440

ggacttgaaa gtgtcaggga cacattggaa gttggagcag ggaaatgatg ggatttatgt 145500

tttgtttttg ttttatgttt agtgttttta agggattgct ctatcagcta tttggaaaat 145560

ttagtgtagg gcttcaagaa gagaagcaga gaaacaacat tcttgccata gtcatagtct 145620

aagtaaggga tgatggtggt gtggattagg ctggtagtgg aagaccagtc cagttcgggt 145680

tgtatttgaa ggtagaggca aaaagattat atttctacca gcaagcccat ctatgaagtt 145740

acttgtatta ttaatttaat tgagacatgc ccacataaac taataaatag gaatttctgc 145800

agtttggtta aacacccctg tatatcctgg ttcttctttt agttgtccag atgtctcttt 145860

-continued

aagtcaagta ttttttggtg gtgtaggagc ctagagattg aatttattca cccaaaaggc 145920

atttgagtga ttactatgtg ccaggcacta tgctgaatgc caaggatgta aataagaggg 145980

cgtagtctca gtctgtttta ctccagcttg gttccttttt aatgaccctg acttgttaag 146040

catatcagtt atcctacaga atgtttaatc ttctgtactt tcctggttgt gttatttagc 146100

ttatttctct ttccttgaca tttcttgtaa actggaagtt acacctatag tcttgatgat 146160

tcgtgttaca cattttagat tagaacacat catgtgttgt atatggtgtt tttgaaagcc 146220

tctctgtata ttggtctgta cattaaaatg ttgcctgaat ggatacacat aaaatttaac 146280

agtgattaca ttagagatga gaagaaagag gtgccttta cttttcaata taccttttcc 146340

tctgcttttt gaactttctt gccctatgca tacgttattg cttaatcatc cacctcatct 146400

cttcccctgt ggctttctgt tgcatttgga atgaaatcta gcctctttgc tgttacctgt 146460

ggatgtccct tgctggcctc tatcacctta ctttgaacca ctcctttcat ggactgagct 146520

ctcattggac tatcttttat tcttttgctg aagtttcttc actttgagtg cctctgcagt 146580

tgctatttca tggctgtggc aagccctgcc atggctttca tgcaaggatg gttcctcctt 146640

ctcatctcaa tattatctct tcagagaggg accttcccaa ctccgatgat ctaaaatcct 146700

ttgtatatac cactcactac cacttctttc ttttcttttc cttttatctt ttttttttct 146760

ttttttttct gagatagggt cttgctctgt tgcccaggct ggaatcacga ctcactgcag 146820

cctcatcttc ttgggctcaa atgatcctct cacctcagcc tctcgagtag ctggaactgc 146880

aggcacacac caccatactt ggcttattat tttacttttt gtagagacag ggtttcacca 146940

aggctggtct caagctcctg ccgcaagcaa tccacatctc tcagcctccc aaagtattgg 147000

gattatagga gtgagccact actcctggcc tattttctta ttcactgtct aaaattatct 147060

tgttcattta tttacatact tgtttatagc ttatttctca gctggacatg gtgcctcaca 147120

cctgtaatct caatactttg ggaggctggg ttggagaatt ggttgagccc aggacttcaa 147180

gaccagcctg ggcaacaaag tgagaccctg tctataaaaa attgtttaaa aattagctgg 147240

gcatggtggc acatgcctgt ggtcccagct acttgggagg cagaggtggg agaatcgctt 147300

gggcccagga ggttgaggcg acggtgagcc atgattgtgc cactgcactc tagcctagtg 147360

acagagtgag accatgtgtc taaaaagtaa ataaaaatag tttctctttc atgactagaa 147420

tattacctct atgtgggcag ggagtttgtc tatactattt ggcactatat ttcctgattc 147480

tgaaattatg cctagcacat ggtaagtact ccttaaatat ttattgactg aattatttaa 147540

tacttaagaa tttcatttgg gattatctga gtggtaagat tacggattat atttatgtaa 147600

gaaaaaatca ttttttaaac ttggttgccc tttgccacac tgacatagac actaagtttt 147660

cttagccaga ttacttccga ggatactcac agaggccatt ctcttctcaa tccccaaata 147720

attgatattt cttagcactt tcaagctaat gcaattctta gatgatgtat ctgtgtatat 147780

catatcctca ttctacaaat gtagaaattg aagtctgggc acagtggctc tcacctgtaa 147840

tctcagcagt ttgggaggcc aaggcgagcg gatcactgag gacaagagtt aagaccagcc 147900

tggccaacat ggtaaagcct tgcctctatt aaaaatacaa caattagggc cgggcgtggt 147960

ggctcacgcc tataatccca gcacgttggg aggccaaggc aggcagatca cgaggtcagg 148020

agttcgagac catcctggct aacacagtga aaccccatct ctactaaaaa tacaaaaaat 148080

tagccaggca tggtggcacg cgcttgtagt cccagctatc gggaggctga ggcaggtgaa 148140

-continued

tcccttgaac ccgggaggcg gaggttgcaa tgagctgaga ttgcaccgct gaactccagc 148200

ctggtcaaca gagggagact ctgtctcaaa aaaaaaaaaa aaaaacaatt agccaggcgt 148260

ggtggcgggt acgagtacct gtaatcccag ctactaggga ggctgaggga ggagaatcac 148320

ttaaacccag gaggtggagt ttgcagcggg ctgataatgc accactacat tccagcctgg 148380

gcaacagagt gagactctgt cttaaaaaaa aaaaaaagaa agaaagaaat tgaggaatgt 148440

ggagattgtg gtctgtgatt tgttaggaat cacacagcag gttagtagca actacagggc 148500

tttggttcag aataccacct tgacaatggt ttgtttacag ttcggctccc cttcctctgc 148560

ctttctctcc ttccttattg agggcagctg gaaagaattt tcatcattta ctagcctata 148620

gctttaattt gagttttgaa accttgataa tagagcacag aggaaaagac tgagttttct 148680

ttttttgaga cagtcttgct ctatggccca ggctggagtg cagtgacacc atctcagctg 148740

gttgcaacct ctgcctccca ggttcaagca attctgcctc agcctctcga gtagctgaga 148800

ttacaggcac gtgtcaccac gcccagctaa ttttctgttt ttgtttcgtt ttgtttttt 148860

ctgagatgga gtcttgctct gtcacccagg ctggagtgca gtggtgcgat gttggctcac 148920

tcaaacctct gtctcctggg ttcaagcaat tcttctgcct cagcctcccc agtagctggg 148980

actacaggta cgtgccacca tccctagttc atttttgtat gtttagtaga gatggggttt 149040

cactatgttg accaggctgg tctcgaactc ctgatctcag gtgatctact cgtctcagtt 149100

tcccaaagtg ctgggattat tggcacacgc ctatttttgt atttttagta gagacggggt 149160

ttcaccatgt tggttagact ggtctcaaac ttctgacctc aagtgatttg cccgccccag 149220

cctcccaaag tgctgggatt acaggcgtga gccaccgtgc ccagccaaga ttgagttttg 149280

aaaagagcct tctgagatta tgagaagggc aagcaagata acttaagaag ttacattaaa 149340

atcatctaag agacagtgta acaagaagga attgtaaaat gatgttatga gcacgtgccc 149400

aatgtagtgg caatcccttg tgcttcgata cattggtggg agacaaaact gtacttaaat 149460

tgataaatcc cttacatgtc attttaagga gcttagactg actcccatca tgtagacatc 149520

agagatttct ttttttttt ttttttttt ttttttttt tttgtgacag agttttgctc 149580

ttgttgccga ggctggagtg caatggcgtg atctcggctc accacaacct ccacctccca 149640

ggttcaagca attctcctgc ctcagcctcc cgagtagctg ggattacagc catgcaccac 149700

cacgcctggc taattttgta tttttagtag agacggggtt tctccatgtt gtggctggtc 149760

tcgaactcct gacctcaggt gatcctcccg cctcagccac ccaaagttct gaaattacag 149820

gcgtgagcca ccgcgcccag cccagagatt tctaaacaga gttctaacca gatgcttttc 149880

cctgtcagta gaatgagaat gaattggagg tgggagagac tggcatgagg gacaccagtc 149940

agccagtgga attagctggt aatgttgata ggagaagaaa aagattcaaa gttaggtagt 150000

ggtagcaaga attagaggga aggtcggatt tatgatatgt ccaaggttga attctaaggt 150060

gaaatttggt ggcagatttc atgtgtaaat tgggaaggta gattgagttt ttttaacatg 150120

ggttttctaa catgtcaata gagtgactct gcaggggggc ctgacgagag aacagtgcat 150180

ggggtgattc aacagccagt tgagccttca tgcagagcat ttaacactgt gactctgtag 150240

actctggttg gcagtaaaat ttcattaaac caatatttaa acccttaggt aataataaaa 150300

attgagggaa aaggatccag gttttgtatt ttttatgaat tcagttattg aattaaacag 150360

gaccttgcct caagaaataa tctaccaaca attaacttgt tttaaagcaa agttaggaag 150420

-continued

tgagcatgtt caaattatta aataaaaaag taagctgtgt atttcattca tagaaataga 150480

ggctggccta cttcggatga ttctcagcat gtgattacag atgtgggctt atacatccta 150540

gggagttaag gcgtactctg gcttggatag agtagagctc tttgaaactc ttctctcacc 150600

cagctagttt atatagacta gagaactaga atgtagcagc atactctgtc ttagaagccc 150660

ttttatatag gagctggtct ggaaggtttg aaaacataac aaatgtgttg gtgtctccca 150720

atgtattgct agattcttac ccaagagcat tatcctggtt agggtttggt ttggttttgt 150780

tttgtttttt aatgtttgcc acaaactaac actagatgtt agttctttca tcaagtgagg 150840

agagtagaag aaaagtccag aactctgaaa caccttttca aaagtttttc aagccatgat 150900

gtttgcaagt taaatgctct gttatgtaag caatataatc agtttttatt aatgtaacat 150960

tccttagtgt tttggggtat cacacaaaaa agaatatcca tatctggaag caacagcttt 151020

taaataagag cattgtggtg gtggtggtga tagtggtttt ttttttttt tttgagttgg 151080

agtctcgctc tgttgcccag gttggagtgc agtggcacga tctcagctcg cttcaacctc 151140

tgctcccagg ttcaagcaat tcttctgcct cagcctcctg agtagctggg attataggca 151200

cctgctacca tgcctggctg atttttatta ttttagtaga gacaggtttc accatgttgg 151260

ccaggctggt cttgaactct taacctcagg tgaatcaccc acctcggcct cccaaagtgc 151320

tggaattaca ggcatgaacc accatggcca gccaaataag agcattttta atgtaaaatt 151380

atgcatgaaa tgtacattca attttgtctt tgtttactag gatccatgtt ctcacaagct 151440

atgaagaaat gggtgcaagg aaatactgat gaggtaaatc ctacctttag gataaaaaga 151500

tttctgttta taagtgccac cctcatgtaa gtgaggttta aaattttcct tttctttagg 151560

tcccatgttt aagcagcatg gcacatttat gttctcttac ccagaatgta ccaagaaagg 151620

gtggtccctt cttaacatct aacaattgcc tggtagtagc agtgaaggta tcttcagtca 151680

gaggctagga ccactgaagg atatacatgc attcaagttt ccatcagcca gcaggcatca 151740

gtaatcagtg tgtagatcaa aagctcaaat gtttccttcc ccactggcag ttttacttca 151800

agtagtggag gcttgctttt ttaatagtta attaagtaca ttgagagatg ggaggtgaaa 151860

aaaggaaaat gttttatttt gaccatctaa tatgaaagta gttcggtgtt aggtatccag 151920

tagttgacac tggaagacag ggaatgacat gttaatattc atagccagag ggtggcccag 151980

gtttttttcgt acatgggaat gaaattctta tccaaataag tagaaattat gtgcgtaagc 152040

catttgttaa gagcactgag tatgtgcatc tcgatccatc taatgaataa ccattatcac 152100

cagtttaaat tattttcttt aggcccagga agagctagct tggaagattg ctaaaatgat 152160

agtcagtgac attatgcagc aggctcagta tgatcaaccg ttagagaaat ctacaaaggt 152220

aaggatgact tcgttttgtg taaactaaaa agtattattt tccaggtgta aaaataaaaa 152280

agaacataag gggtttcttt gcctttgaag gattaactgc tgtggggatt accttcttat 152340

cataagcaac tagaaaattg acaaactaaa tgaaacaact gtttgcatat attggacaat 152400

gggcaataca gggaaaccat ggaaaccaaa cagagcccag tagtcttgct gaacgaaaga 152460

gttaaatatc aaagttcagg ccaggtgcag tggctcacgc ctgtaatccc agcactttgg 152520

gaggccaagg cgggtgaatc acttgaggtc aggagttcaa gaccagcctg gccaacatgg 152580

tgaaaccctg tcttagccgg gtgtggtggc aggcacctgt aatcccaact atttgggagg 152640

ctgaggcagg agaatcgctt gaaccaggga ggcggaggtt gcagtgagcc gagatcacac 152700

-continued

cactgcactc cagcctgggc gacgagcgaa accccatttc aaaaaaaaaa tcaaagttca 152760

gagagctcaa tttgagtaga agttgtagga taaggtagca gaaaagagga agctgcccag 152820

aaagaaagcc gtagagatat ttagagagat tcccatggat ccttggccta ggagtgatct 152880

gtatatgtgt ggggtgaaaa cgcatgtgtc caggtagaga acccccccaga aattagtagg 152940

ctgaatgatt gctggaacat agggctaaga aaagttcatg gccagaagga tctggccaga 153000

gtagagagac ttagtaatac acaaggcatt gggtagtgtc ttcacagagg ttatgcctta 153060

ctactgaaga taaattagtc ctagagtaca agcacctgaa ccaagtttca aagcaaattt 153120

ttaaagggtc aaattaccta acaactgcat gccaaaacaa aggcctaacc ctctttacag 153180

taacacaaca aaattcagca cttcacagtg taaagttaga atgtctgacg tccaggctgg 153240

gcgcagtggc tcatgcctgt aatcccagca ctttgggagg ccgaggcagg tagatgacct 153300

gaggtcagga gttcaagacc agcctggcta acatggtgca accccgtctc tattaaaaat 153360

acaaaaactt agccaggcat ggtggccggc acctgtgatc ccggctactt gggaggctga 153420

ggcaggagaa ttgcctgaac ccaggaggtg aaggttgcag tgagccgaga tcgcaccact 153480

gcactctggt ctgggcaaaa agagcaaaac tcaggctcaa aaaaaaaaaa gaatgtctga 153540

cgtcaatcac aaattaccaa gcatgacatg aagttgacct ataaccagga gaaaactcaa 153600

tctatagaaa cagacccaga tgtgagaaag atgatgaatt tagcagacaa agaccatcaa 153660

gtggctattt taaatattaa aaatatgttc aagtggccag gtgcagtggc tcatgcctgt 153720

aatcccagca ctttgggagg ccaaggtggg taggagttca agaccagctt ggccaatatg 153780

gtgaaacccc ttctctacta aaaatacaaa aaaattagct gggcatggtg gcaggtgcct 153840

atagtcccag ctatatggga ggctgaggca caagaatcac ttgaacccgg gaggtggagg 153900

ttgaggttgc agtaagccga gattgtgcca cttgtactcc agcctggaca acagagtgag 153960

actctgtctc aaaaaaaaaa aaaaaaaagt taaagaaaac aagagtataa tgagaaaaat 154020

gcaaaatagt tttaaaagaa ccaaatggaa tttcttaaaa taaaaaatac cagaaatggg 154080

ggccgggcgt ggtagctcac gtctataatc ccagcacttt gtgggggctg aggcaggcag 154140

atcacctgag atcggtagtt caaggccagc ctgaccaaca tggagaaacc tcatctctac 154200

taaaaatata aaattagctg ggcgtggtgg cgcattgcct gtaatcccag ctacttggga 154260

ggctgaggca ggagaattgc ttgaacccgg gaggcagagg ttgcggtgag ctgagattgc 154320

accagtgcac tccagcttgg gccacaagag tgaaactccg tctcaaaaaa aaaacaaaaa 154380

aaaacagtag actcgaagaa ctagctgagt ttttctttac tttaggcagt aagtgtgacc 154440

ttttgcaggt gactacttta gttcctcatg tcctcattag tagatcagag aaattcgaca 154500

ccaaaacccc aaaagaaaaa ccccttctaa tcctcattcc atgattttat gaatgcatga 154560

agtcctaggc ctgcgaagga atactcattc tctttatcct gtgttgatac ctctctgctt 154620

caacctccaa ctcgacattt gcctatagga tgtacttgga cattcagcat aaactacctc 154680

acaccattac tgaattgctt catgtgcaca tgtcccatgc cacaataccg gggaccttgt 154740

cttccgtgat atttgtccgc agtgctgtga ctacaggagg gagtcagtga atgtctgcat 154800

gtgtgtcttt accatcccta ttgaatatgc tctagggtta attcctagaa gtagaattac 154860

tctattgaaa attggcaata tttttcattc taatatctat tgccaacatg ggaaagcaag 154920

tctggatgcc agtccttgtt atatgcccct tgggtaagtt acgtaacctc tttaagcttc 154980

-continued

tgttcactca tattttaaca aggaaaatta caatatttta cctcacaaaa ttgtagtcag 155040

cttctggctg tcttaaactc tggtatatag taaacactaa gtgttggtgt ccatccttaa 155100

tttgtaataa taggtcactt gttagagaaa tgcaccttac cattttcttt tcttttcttt 155160

tttcagttat gactcaaaac ttgagataaa ggaaatctgc ttgtgaaaaa taagagaact 155220

tttttccctt ggttggattc ttcaacacag ccaatgaaaa cagcactata tttctgatct 155280

gtcactgttg tttccaggag agaatgggag acaatcctag acttccacca taatgcagtt 155340

acctgtaggc ataattgatg cacatgatgt tcacacagtg agagtcttaa agatacaaaa 155400

tggtattgtt tacattacta gaaaattatt agttttccaa tggcaataac ccatttatga 155460

gagtgtttta gcctactgga atagacaggg accacatcct ctgggaagca gataagcata 155520

gaactgatac ttgatgcaca ctcgtagtgg taactcatcc ctaatcagca ttgtaaagca 155580

ggtgccagag gtggtttgct ttgtccttcc aaagcaggtg agtcagcccc accgagagcc 155640

aggcagcttt gagtggcagc gtggtgctag cagcttcagc ggaacagggt gagagttaat 155700

tatgcagtct tcttgacagc ggcattaatt tggaaggaaa ctgacaagtc atgggtcaag 155760

tttcagtgac ttcctccttc ctctgatggc agtatatagt tttcacattt taattcctcc 155820

tcctgagatg cactatactt aaaaccattc tctcccctgc taacagaagg gtgtgaatct 155880

ggtttacttt gagcattagg atttgcccct ttggaattct gcactccagt tacttaactt 155940

tcccttcaga atacatgtgg aaagaaagaa agaaatagcg atgactccac ttttgccccc 156000

gtggcacctt gaacaaagca gttcttccca aattatactt ttttttttct taaataaggt 156060

gagcaggatg actggggaga gagaaacatt tgactttgac tgcctccccc attctttgct 156120

gtgagctgga aagtgtgcag ttggtcgtct ttcttctcct ttctttagga tagtaagaga 156180

ctcactcact gcacttctgc tcagttggct tctgcatcgg gatcacacag ccatcagcag 156240

gactgcccag ttggtgagca cactccattg accacgcggc gccagcgctt cctcaatgca 156300

catgattgag aggaaagaaa gttctcttag atgttactgc ttttgctcag actttgcaaa 156360

aaaaaaaata tatatatata tgtataaata tataattatt aatcactttt gtccttgaga 156420

aagtcttgaa tgaacagaga atttattcca ttgcaatatt tgattgtata gaggcacact 156480

gtttcatcga cagaagaagc aaaaaggctt tgtgtaagtt tttggtacta tgtaccacct 156540

ctgttattct tttaaagctg aagtattcat gtacttaaac catattatat ttaattgtgt 156600

ttgattttaa aatatatata tatgaattct atttaaaatt gtgtcaactt tctgctttca 156660

gggcatttat ggctcttctg ttgaaatata ttgatctttc caaatatttt catttgcttt 156720

ctaaaaaccc agaacatgag ccactactgg actttgcctt gtgtttgaag tgtatggcat 156780

aaacccaagg tttttattag tcatctatgc tgtgattaat tcattttgtt cttttaacaa 156840

aatatttcca tccacttcac attgcttcaa tctttaacag aaaagcaata taaaggttat 156900

agaataaaat gtggttttgg gcaactcttg ctgcctctgc atgttttgga ataacaattt 156960

ctacaagact ctaggctgtt taaactagtg ctttcagtta agataaattc taatcatttc 157020

tttgtatata cattttgtgc ttctgagcta gagatgccaa gtagttgtaa actgcttata 157080

aagagaatag cagcaaattt gagactcggc tacttttttc tgccccacct gctttgagac 157140

acagaagcgg agtgtggccc gaaattatta gccagattta atatttgatc taaagtaggt 157200

ccttgtactc attttaaagt tggaatttga ttcctccaac attgagcacc caccatgttc 157260

-continued

caggctctgt gcattgtgcc cacaaaataa gattccctgg tggagttttt atgggttcaa 157320

ataatcagtt gaacacccct catctttatc atgttgttga cattgacaca aattgtttaa 157380

aaagaaaaga tattagagag aaagtggtac ctttgtaact tgatgtgtct tcatcattcg 157440

gtaagatttg atgaaagtaa aaagcaaatg tcagccaaat ccagtgaaca gcaataaaac 157500

agggagtaac tttttataac tttttctact tggatttcaa cattcagtag agcttttcga 157560

aatgtaagta gtttacagta ctggaggttt gactagttca gtaggaattt ggaggggaag 157620

gtcattctga attgtaacaa agtacaaact tctttgctgt tttatttaag tactgagagc 157680

taagcacctg atgaagtgac tgacctctct ccagtgacag tgtttgggta cctgcctgac 157740

ttcaggagtg gggtttatgt ttctacacag tgacctttte tctcgccctc tcctccctct 157800

tgcccacaca ccagttgatt ggacctgggt tgaactcctg atccagacag gcccaagaca 157860

gttcttaatg ttaagaattt tggggccggg cacggtggct catgcctgta attgcaacac 157920

tttgggaggc cgagacaggc ggatcacttg aggtcagggg ttcgaggcca gcctggccaa 157980

catggtgaaa ccctgtcttt actaaaaata caaaaattag ctgggcatgg tggcgcacgc 158040

ctgtaatccc agctacgtgg gtggctgaga caggggaatc gcttgaacct ggaggcggag 158100

gttgtgcaat gagccgagac cgtgtcactg cattccagcc tgggtgacag agggagactc 158160

tgtctccaaa aataaaaata agaaaaagaa ttttgggcta ggtgcagtgg ctcacgcctg 158220

taattacagc attttggaag gcccaagatg ggcagatcac ttgaggacag gagttcgaga 158280

ccagcctgga caacatggtg aaactccatc tctactaaaa agacaaaagt tagccagatg 158340

tggtgatggg cacctataat cctagctcct cgggaggctg gggcaggaga atcacttgaa 158400

cccaggaagc agagattgca gtgagccaag atcacatctc tgcactccag cctgggcaac 158460

agagcaagac tctgtctcaa aaaaaaaaga atttggccag gcgcagtggt tcacgcctgt 158520

aatcccagca ctttgggagg ccaaggcagg cagatcacga ggtcaggaga tcgagattgt 158580

cctggctaac atggtgaaac cctgtctcta ctaaaaatac aaaacattag ccgggtgtgg 158640

tggtgggcac ctgtagtccc agctactagg gaggctgagg cagaggaagg atgtgaaccc 158700

aggaggcgga gcttgcagta agccaagatc gtgccactgc actacagtct gggcgacaga 158760

gtgagactcc gtctcaaaaa aaaaaagaat tttggccggg tgcggtggca catgcctgta 158820

gtcccagcac tttgggagac caaagtgggc ggattacctg aggtcaggag ttcaagacca 158880

gtccggccaa tatggcgaaa ccctgtctct tactaaaaaa aatacaaaaa ttagccaggt 158940

gtggtggcgg gcacctgggg aggctgaggc agggagaaat gcttgaaccg gggaggcaga 159000

ggttgcagta agccaagatc gtgccactgc actccagagc aagactcttt ctcaaaaaaa 159060

aaaaaaaaag aattttgcat ggggaaggag agatactgtt caccatctgg aatggtgctt 159120

ggatgtggca cttacaaaat caggagccag cactgcatgg acaaacagaa gcatgtgggc 159180

ctgagatagc aggtaccttg ataaccctga agacatcctt ggtttctgca tctattcctg 159240

catccttgca ttggactaca ttaatctgtc agttatcctt ataatgattt ttgatttttt 159300

ttttttgaga tggagtttcg ctcttgttgc ccaggctgga gtgcaatggc acgatctcgg 159360

ctcaccacaa cctccacctc ccaggttcaa gtgattctgc tgcctcagcc tcctgagtaa 159420

ctgggattac aggcatgcgc caccacacct ggctaatttt gtatttttag tagagacggg 159480

gtttctccat gttggtcagg ctggtctcga actcccaacc tcaggtgatc accctgtctc 159540

-continued

ggcctcccaa agtgctggga ttacaggcgt aagccatggt acccggtctg ttttttgatt 159600

ttttgaaacc agtctgaagt gagtttttt aattacgtga aaggagtttg gctaaaatac 159660

tgccatactg ccctaatgcc taatgattat gtattctcag catgtctgca aagtactgct 159720

gatttctgga gaataatttt tctttagtaa acttcactta agtcgtcatg tgtattctct 159780

caaaatggta tcctaaccta atggagctaa aagacacccc ttgttttat aacaagcagt 159840

tactgaggcc caggaagggg agaagtccct ggcttgtgag atgatcacca ttagaactca 159900

ggcctgggcc agtgcctttt catgcttctc agatccttcc aaagaataat gaagattata 159960

accgctttta gcaattgtaa taaacccaga aatagaaagc tttttggtta gagtactggt 160020

agaagtttgg cgggagagat aatttttaca aaatttgtaa atacctgcca attctatata 160080

ctaggcaagg tctctggcct tgtaaaaccc ctcaaggtta caactttggt ggcccacact 160140

aatagttacc cactgaggcc ctctccgggt gaacattgag cactagagga agcccctctg 160200

cttgggcagg actgggcgtg gtgcagagta ggagcggtga tactgtggat tctgggcagg 160260

tggagatggc cagtgatgtc caataaagga cactggaggg agcagtgtga gtaaaggccc 160320

tgagggcatt catgttcagg gagggttgct gcccactggc ttgcttggca cacaggagag 160380

tgggtattcc tgccttagta actttatgta aacaagtatt tcctcagtct gttcctctca 160440

aactgcctgc tctggcacat tcagaatgtc acagaactca cctggatgca ttcagcccct 160500

tgcctaaagg tgacagtgca tctccttccc caccccaccc ctcataccac tgaagcacct 160560

gtcagactgg cccagtctgt gggcaaggag cctagagagg gcttagtttc agcttgaaag 160620

gagctgggat ttaccaagaa gcaaatgaga gacgaggatt gcaacaactg tgccatttcc 160680

ccagcttcag ctgactcctg tatattgact gtgccttcag actcatccgt aagtgacccc 160740

aggctggcct ctcccacatc acagtaagaa ttccacacac catacaactt ggaaagaggc 160800

tccagctgaa ggaagcccca cacttctttc aagtttttct tagtcttctc ttcttggcaa 160860

agagtacctt ttgtttcttc taattatgta actattggtt tagtaaatat tcacccattc 160920

agtcaccctg taagtggcag gcactgttta cagggacaca ggaaggaata aaaacttgca 160980

ggcaccttgg agcttgcatt ctattgaaga ggtaatggaa gttgggatag cagctaaact 161040

atgctggtat tggccaggcg cagtggctca cacctgtaat cccagcactt tggaggccaa 161100

ggtgggcaga tcatgaagtc aggagatcga gaccatcctg gctaacatgg tgaaaccccg 161160

tctctactaa aagtaaaaaa aaaaattagc caggtgtggt ggcgggcgcc tgtagtccca 161220

gctacttggg aggctgaggc aggagaatgg tgtgaaccca ggaggcgaag attgcagtga 161280

gccgagatgg caccactgca ctccagcctg ggtgacagag cgagactctg tctcagaaaa 161340

aaaaaatatg ctggtagttt tgattcaaga tggcctttgg agcccatgat ttaggtctcg 161400

tacccaccaa ggtctactgg aaaacatcag gctctcctgc tatagaccca tagggagagc 161460

tgcagccgag agggggagct gaagagaagt gccccttctg tgtcctgtca gcctcatcct 161520

tccgcaagga ccagttgctg tgccactcca ttcacttgct gcaagactgg aggtttttcc 161580

tcaggtgttg agcacctggt ttacaagatg tcagcatctt gatgcctgag accatcaagg 161640

caagtctctg aacagggctt accttagagt aaggcttaga agaggccgta aagtcagtct 161700

cagctccgtg gctctgcaga gctttgggac atgtgaattc ttaaaaacaa gactattgta 161760

cagttactat atgcatgcag tataaaatta taaccttgga aaatcctagc tagctgttga 161820

-continued

```
gctaattcca taaagtaatc agctcctgag ttctgcagtg gtaataataa tcagcataat 161880

gagtaaacac tgtgtgtgcc aggcagcgtc tcatttgatc cttgtgataa tcttgtaagt 161940

actgattttc tcccttcttt aaacaaagtt ttttttttt ttttagagag ggtctcacta 162000

tgttgcccag gctagtcttg aattc                                      162025


<210> SEQ I NO 37
<211> LENGTH: 1350
<212> TYPE: DNA
<213> ORGANISM: Homo Sapien
<220> FEATURE:
<221> NAME/KEY: CDS
<222> LOCATION: (213)...(920)
<300> PUBLICATION INFORMATION:
<308> DATABASE ACCESSION NUMBER: GenBank AJ242973
<309> DATABASE ENTRY DATE: 1999-10-26

<400> SEQUENCE: 37

gcggccgcgt cgacgtgaca gccggtacgc ccgggtttgg gcaacctcga ttacgggcgg     60

cctccaggcc cgccagcagc gccccgcgcc gcccgcccgc gcccctgccg ccccccggtt    120

ccggccgcgg accccactct ctgccgttcc ggctgcggct ccgctgccgg tagcgccgtc    180

ccccgggacc acccttcggc tggcgccctc cc atg ctc tcg gcc acc cgg agg      233
                                    Met Leu Ser Ala Thr Arg Arg
                                     1               5

gct tgc cag ctc ctc ctc ctc cac agc ctc ttt ccc gtc ccg agg atg      281
Ala Cys Gln Leu Leu Leu Leu His Ser Leu Phe Pro Val Pro Arg Met
         10                  15                  20

ggc aac tcg gcc tcg aac atc gtc agc ccc cag gag gcc ttg ccg ggc      329
Gly Asn Ser Ala Ser Asn Ile Val Ser Pro Gln Glu Ala Leu Pro Gly
     25                  30                  35

cgg aag gaa cag acc cct gta gcg gcc aaa cat cat gtc aat ggc aac      377
Arg Lys Glu Gln Thr Pro Val Ala Ala Lys His His Val Asn Gly Asn
 40                  45                  50                  55

aga aca gtc gaa cct ttc cca gag gga aca cag atg gct gta ttt gga      425
Arg Thr Val Glu Pro Phe Pro Glu Gly Thr Gln Met Ala Val Phe Gly
                 60                  65                  70

atg gga tgt ttc tgg gga gct gaa agg aaa ttc tgg gtc ttg aaa gga      473
Met Gly Cys Phe Trp Gly Ala Glu Arg Lys Phe Trp Val Leu Lys Gly
             75                  80                  85

gtg tat tca act caa gtt ggt ttt gca gga ggc tat act tca aat cct      521
Val Tyr Ser Thr Gln Val Gly Phe Ala Gly Gly Tyr Thr Ser Asn Pro
         90                  95                 100

act tat aaa gaa gtc tgc tca gaa aaa act ggc cat gca gaa gtc gtc      569
Thr Tyr Lys Glu Val Cys Ser Glu Lys Thr Gly His Ala Glu Val Val
    105                 110                 115

cga gtg gtg tac cag cca gaa cac atg agt ttt gag gaa ctg ctc aag      617
Arg Val Val Tyr Gln Pro Glu His Met Ser Phe Glu Glu Leu Leu Lys
120                 125                 130                 135

gtc ttc tgg gag aat cac gac ccg acc caa ggt atg cgc cag ggg aac      665
Val Phe Trp Glu Asn His Asp Pro Thr Gln Gly Met Arg Gln Gly Asn
                140                 145                 150

gac cat ggc act cag tac cgc tcg gcc atc tac ccg acc tct gcc aag      713
Asp His Gly Thr Gln Tyr Arg Ser Ala Ile Tyr Pro Thr Ser Ala Lys
            155                 160                 165

caa atg gag gca gcc ctg agc tcc aaa gag aac tac caa aag gtt ctt      761
Gln Met Glu Ala Ala Leu Ser Ser Lys Glu Asn Tyr Gln Lys Val Leu
        170                 175                 180
```

-continued

```
tca gag cac ggc ttc ggc ccc atc act acc gac atc cgg gag gga cag      809
Ser Glu His Gly Phe Gly Pro Ile Thr Thr Asp Ile Arg Glu Gly Gln
    185                 190                 195

act ttc tac tat gcg gaa gac tac cac cag cag tac ctg agc aag aac      857
Thr Phe Tyr Tyr Ala Glu Asp Tyr His Gln Gln Tyr Leu Ser Lys Asn
200                 205                 210                 215

ccc aat ggc tac tgc ggc ctt ggg ggc acc ggc gtg tcc tgc cca gtg      905
Pro Asn Gly Tyr Cys Gly Leu Gly Gly Thr Gly Val Ser Cys Pro Val
                220                 225                 230

ggt att aaa aaa taa ttgctcccca catggtgggc ctttgaggtt ccagtaaaaa      960
Gly Ile Lys Lys  *
            235

tgctttcaac aaattgggca atgcttgtgt gattcacaat cgtggcattt aaagtgcaca   1020

aagtacaaag gaatttatac agattgggtt taccgaagta taatctatag gaggcgcgat   1080

ggcaagttga taaaatgtga cttatctcct aataagttat ggtgggagtg gagctgtgcg   1140

gtttcctgtg tcttctgggg tctgagtgaa gatagcaggg atgctgtgtt caccccttctt   1200

ggtagaagct aaggtgtgag ctgggaggtt gctggacagg atgggggacc ccagaagtcc   1260

tttatctgtg ctctctgccc gccagtgcct tacaatttgc aaacgtgtat agcctcagtg   1320

actcattcgc tgaaatcctt cgctttacca                                    1350


<210> SEQ ID NO 38
<211> LENGTH: 235
<212> TYPE: PRT
<213> ORGANISM: Homo Sapien

<400> SEQUENCE: 38

Met Leu Ser Ala Thr Arg Arg Ala Cys Gln Leu Leu Leu Leu His Ser
 1               5                  10                  15

Leu Phe Pro Val Pro Arg Met Gly Asn Ser Ala Ser Asn Ile Val Ser
            20                  25                  30

Pro Gln Glu Ala Leu Pro Gly Arg Lys Glu Gln Thr Pro Val Ala Ala
        35                  40                  45

Lys His His Val Asn Gly Asn Arg Thr Val Glu Pro Phe Pro Glu Gly
    50                  55                  60

Thr Gln Met Ala Val Phe Gly Met Gly Cys Phe Trp Gly Ala Glu Arg
65                  70                  75                  80

Lys Phe Trp Val Leu Lys Gly Val Tyr Ser Thr Gln Val Gly Phe Ala
                85                  90                  95

Gly Gly Tyr Thr Ser Asn Pro Thr Tyr Lys Glu Val Cys Ser Glu Lys
            100                 105                 110

Thr Gly His Ala Glu Val Val Arg Val Val Tyr Gln Pro Glu His Met
        115                 120                 125

Ser Phe Glu Glu Leu Leu Lys Val Phe Trp Glu Asn His Asp Pro Thr
    130                 135                 140

Gln Gly Met Arg Gln Gly Asn Asp His Gly Thr Gln Tyr Arg Ser Ala
145                 150                 155                 160

Ile Tyr Pro Thr Ser Ala Lys Gln Met Glu Ala Ala Leu Ser Ser Lys
                165                 170                 175

Glu Asn Tyr Gln Lys Val Leu Ser Glu His Gly Phe Gly Pro Ile Thr
            180                 185                 190

Thr Asp Ile Arg Glu Gly Gln Thr Phe Tyr Tyr Ala Glu Asp Tyr His
        195                 200                 205
```

-continued

Gln Gln Tyr Leu Ser Lys Asn Pro Asn Gly Tyr Cys Gly Leu Gly Gly
210 215 220

Thr Gly Val Ser Cys Pro Val Gly Ile Lys Lys
225 230 235

<210> SEQ ID NO 39
<211> LENGTH: 481
<212> TYPE: DNA
<213> ORGANISM: Homo Sapien
<300> PUBLICATION INFORMATION:
<308> DATABASE ACCESSION NUMBER: GenBank AW195104
<309> DATABASE ENTRY DATE: 1999-11-29

<400> SEQUENCE: 39

ggcattattg gactgtaggt ttttattaaa acaaacattt ctcatagctc taagcaaagc 60

attagaattc atcaagcgga ctcacatctt ttctctgcac agagaggggc tgaaaaggga 120

gagaaagtcc cttatgtatg tctagatttg gtaaagcgaa ggatttcagc gaatgagtca 180

ctgaggctat acacgtttgc aaattgtaag gcactggcgg gcagagagca cagataaagg 240

acttctgggg tcccccatcc tgtccagcaa cctcccagct cacaccttag cttctaccaa 300

gaagggtgaa cacagcatcc ctgctatctt cactcagacc ccagaaaacc cagggaaacc 360

cgacagctcc actcccacca taacttatta ggagataagt cacattttat caacttgcca 420

tcgcgcctcc tatagattat acttcggtaa acccaatctg tataaattcc tttgtacttt 480

g 481

<210> SEQ ID NO 40
<211> LENGTH: 390
<212> TYPE: DNA
<213> ORGANISM: Homo Sapien
<300> PUBLICATION INFORMATION:
<308> DATABASE ACCESSION NUMBER: GenBank AW874187
<309> DATABASE ENTRY DATE: 2000-05-22

<400> SEQUENCE: 40

tttttttat tggactgtag gtttttatta aaacaaacat ttctcatagc tctaagcaaa 60

gcattagaat tcatcaagcg gactcacatc ttttctctgc acagagaggg ctgaaaaggg 120

agagaaagcc ccttatgtat gtctagattt ggtaaagcga aggatttcag cgaatgagtc 180

actgaggcta tacacgtttg caaattgtaa ggcactggcg ggcagagagc acagataaag 240

gacttttggg ggtcccccat tcctgtccag caacctccca gctcacacct tagcttctac 300

caagaagggg tgaacacagc atccctgcta tcttcactca gacccccaga agacacagga 360

aaccgcacag ctccactccc accataactt 390

<210> SEQ ID NO 41
<211> LENGTH: 43
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 41

agcggataac aatttcacac agggagctag cttggaagat tgc 43

<210> SEQ ID NO 42
<211> LENGTH: 22

-continued

<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 42

gtccaatata tgcaaacagt tg 22

<210> SEQ ID NO 43
<211> LENGTH: 23
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 43

agcggataac aatttcacac agg 23

<210> SEQ ID NO 44
<211> LENGTH: 18
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 44

actgagcctg ctgcataa 18

<210> SEQ ID NO 45
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 45

tctcaatcat gtgcattgag g 21

<210> SEQ ID NO 46
<211> LENGTH: 43
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 46

agcggataac aatttcacac agggatcaca cagccatcag cag 43

<210> SEQ ID NO 47
<211> LENGTH: 23
<212> TYPE: DNA
<213> ORGANISM: oligonucleotide primer

<400> SEQUENCE: 47

agcggataac aatttcacac agg 23

<210> SEQ ID NO 48
<211> LENGTH: 18
<212> TYPE: DNA
<213> ORGANISM: Oligonucleotide primer

<400> SEQUENCE: 48

ctggcgccac gtggtcaa 18

-continued

<210> SEQ ID NO 49
<211> LENGTH: 20
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 49

tttctctgca cagagagggc 20

<210> SEQ ID NO 50
<211> LENGTH: 44
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 50

agcggataac aatttcacac agggctgaaa tccttcgctt tacc 44

<210> SEQ ID NO 51
<211> LENGTH: 23
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 51

agcggataac aatttcacac agg 23

<210> SEQ ID NO 52
<211> LENGTH: 18
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 52

ctgaaaaggg agagaaag 18

<210> SEQ ID NO 53
<211> LENGTH: 20
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 53

tcccaaagtg ctggaattac 20

<210> SEQ ID NO 54
<211> LENGTH: 22
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 54

gtccaatata tgcaaacagt tg 22

<210> SEQ ID NO 55
<211> LENGTH: 20

-continued

<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Primer

<400> SEQUENCE: 55

cccacagcag ttaatccttc 20

<210> SEQ ID NO 56
<211> LENGTH: 18
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 56

gcgctcctgt cggtgcca 18

<210> SEQ ID NO 57
<211> LENGTH: 18
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 57

gcctgactgg tggggccc 18

<210> SEQ ID NO 58
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 58

catgcatgca cggtc 15

<210> SEQ ID NO 59
<211> LENGTH: 30
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 59

cagagagtac ccctcgaccg tgcatgcatg 30

<210> SEQ ID NO 60
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 60

catgcatgca cggtt 15

<210> SEQ ID NO 61
<211> LENGTH: 30
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

-continued

<400> SEQUENCE: 61

gtacgtacgt gccaactccc catgagagac 30

<210> SEQ ID NO 62
<211> LENGTH: 14
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 62

catgcatgca cggt 14

<210> SEQ ID NO 63
<211> LENGTH: 18
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 63

gcctgactgg tggggccc 18

<210> SEQ ID NO 64
<211> LENGTH: 26
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 64

gtgctgcagg tgtaaacttg taccag 26

<210> SEQ ID NO 65
<211> LENGTH: 28
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 65

cacggatccg gtagcagcgg tagagttg 28

<210> SEQ ID NO 66
<211> LENGTH: 19
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 66

actgggcatg tggagacag 19

<210> SEQ ID NO 67
<211> LENGTH: 18
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 67

gcactttctt gccatgag 18

-continued

<210> SEQ ID NO 68
<211> LENGTH: 14
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 68

tcagtcacga cgtt 14

<210> SEQ ID NO 69
<211> LENGTH: 14
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 69

cggataacaa tttc 14

<210> SEQ ID NO 70
<211> LENGTH: 37
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 70

caatttcatc gctggatgca atctgggcta tgagatc 37

<210> SEQ ID NO 71
<211> LENGTH: 37
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 71

caatttcaca cagcggatgc ttcttttggc tctgact 37

<210> SEQ ID NO 72
<211> LENGTH: 40
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 72

tcagtcacga cgttggatgc caataaaagt gactctcagc 40

<210> SEQ ID NO 73
<211> LENGTH: 37
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 73

cggataacaa tttcggatgc actgggagca ttgaggc 37

<210> SEQ ID NO 74
<211> LENGTH: 38

-continued

<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 74

tcagtcacga cgttggatga gcagatccct ggacaggc 38

<210> SEQ ID NO 75
<211> LENGTH: 38
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 75

cggataacaa tttcggatgg acaaaatacc tgtattcc 38

<210> SEQ ID NO 76
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 76

tcagtcacga cgttggatgc agagcagctc cgagtc 36

<210> SEQ ID NO 77
<211> LENGTH: 32
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 77

cagcggtgat cattggatgc aggaagctct gg 32

<210> SEQ ID NO 78
<211> LENGTH: 38
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 78

tcagtcacga cgttggatgc ccacatgcca cccactac 38

<210> SEQ ID NO 79
<211> LENGTH: 35
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 79

cggataacaa tttcggatgc ccgtcaggta ccacg 35

<210> SEQ ID NO 80
<211> LENGTH: 37
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

-continued

<400> SEQUENCE: 80

tcagtcacga cgttggatgc ccacagtgga gcttcag 37

<210> SEQ ID NO 81
<211> LENGTH: 22
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 81

gctcatacct tgcaggatga cg 22

<210> SEQ ID NO 82
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 82

tcagtcacga cgttggatga ccagctgttc gtgttc 36

<210> SEQ ID NO 83
<211> LENGTH: 34
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 83

tacatggagt tcggggatgc acacggcgac tctc 34

<210> SEQ ID NO 84
<211> LENGTH: 40
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 84

tcagtcacga cgttggatgg ggaagagcag agatatacgt 40

<210> SEQ ID NO 85
<211> LENGTH: 29
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 85

gaggggctga tccaggatgg gtgctccac 29

<210> SEQ ID NO 86
<211> LENGTH: 30
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 86

tgaagcactt gaaggatgag ggtgtctgcg 30

-continued

<210> SEQ ID NO 87
<211> LENGTH: 38
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 87

cggataacaa tttcggatgc tgcgtgatga tgaaatcg 38

<210> SEQ ID NO 88
<211> LENGTH: 26
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 88

gatgaagctc ccaggatgcc agaggc 26

<210> SEQ ID NO 89
<211> LENGTH: 27
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 89

gccgccggtg taggatgctg ctggtgc 27

<210> SEQ ID NO 90
<211> LENGTH: 31
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide Template

<400> SEQUENCE: 90

cgcagggttt cctcgtcgca ctgggcatgt g 31

<210> SEQ ID NO 91
<211> LENGTH: 43
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Biotinylatd primer

<400> SEQUENCE: 91

tgcttatccc tgtagctacc ctgtcttggc cttgcagatc caa 43

<210> SEQ ID NO 92
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 92

agcggataac aatttcacac aggccatcac accgcggtac tg 42

<210> SEQ ID NO 93
<211> LENGTH: 44

-continued

<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 93

cccagtcacg acgttgtaaa acgtcttggc cttgcagatc caag 44

<210> SEQ ID NO 94
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 94

agcggataac aatttcacac aggccatcac accgcggtac tg 42

<210> SEQ ID NO 95
<211> LENGTH: 20
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 95

ctccagctgg gcaggagtgc 20

<210> SEQ ID NO 96
<211> LENGTH: 17
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Oligonucleotide primer

<400> SEQUENCE: 96

cacttcagtc gctccct 17

<210> SEQ ID NO 97
<211> LENGTH: 23
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Biotinylated primer

<400> SEQUENCE: 97

cccagtcacg acgttgtaaa acg 23

<210> SEQ ID NO 98
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 98

cctttgagaa agggctctgc ttgagttgta gaaagaaccg ctgcaacaat ctgggctatg 60

agatcaataa agtcagagcc aaaagaagca gcaaaatgta 100

<210> SEQ ID NO 99
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 99

-continued

cctttgagaa agggctctgc ttgagttgta gaaagaaccg ctgcaacaat ctgggctatg 60

agatcagtaa agtcagagcc aaaagaagca gcaaaatgta 100

<210> SEQ ID NO 100
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 100

gaattatttt tgtgtttcta aaactatggt tcccaataaa agtgactctc agcgagcctc 60

aatgctccca gtgctattca tgggcagctc tctgggctca 100

<210> SEQ ID NO 101
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 101

gaattatttt tgtgtttcta aaactatggt tcccaataaa agtgactctc agcaagcctc 60

aatgctccca gtgctattca tgggcagctc tctgggctca 100

<210> SEQ ID NO 102
<211> LENGTH: 84
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 102

taataggact acttctaatc tgtaagagca gatccctgga caggcgagga atacaggtat 60

tttgtccttg aagtaacctt tcag 84

<210> SEQ ID NO 103
<211> LENGTH: 84
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 103

taataggact acttctaatc tgtaagagca gatccctgga caggcaagga atacaggtat 60

tttgtccttg aagtaacctt tcag 84

<210> SEQ ID NO 104
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 104

ctcaccatgg gcatttgatt gcagagcagc tccgagtccg tccagagctt cctgcagtca 60

atgatcaccg ctgtgggcat ccctgaggtc atgtctcgta 100

<210> SEQ ID NO 105
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 105

ctcaccatgg gcatttgatt gcagagcagc tccgagtcca tccagagctt cctgcagtca 60

atgatcaccg ctgtgggcat ccctgaggtc atgtctcgta 100

-continued

<210> SEQ ID NO 106
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 106

agcaaggact cctgcaaggg ggacagtgga ggcccacatg ccacccacta ccagggcacg 60

tggtacctga cgggcatcgt cagctggggc cagggctgcg 100

<210> SEQ ID NO 107
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 107

agcaaggact cctgcaaggg ggacagtgga ggcccacatg ccacccacta ccggggcacg 60

tggtacctga cgggcatcgt cagctggggc cagggctgcg 100

<210> SEQ ID NO 108
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Hom sapien

<400> SEQUENCE: 108

caataactct aatgcagcgg aagatgacct gcccacagtg gagcttcagg gcgtggtgcc 60

ccggggcgtc aacctgcaag gtatgagcat acccccttc 100

<210> SEQ ID NO 109
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 109

caataactct aatgcagcgg aagatgacct gcccacagtg gagcttcagg gcttggtgcc 60

ccggggcgtc aacctgcaag gtatgagcat acccccttc 100

<210> SEQ ID NO 110
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 110

ttgaagcttt gggctacgtg gatgaccagc tgttcgtgtt ctatgatcat gagagtcgcc 60

gtgtggagcc ccgaactcca tgggtttcca gtagaatttc 100

<210> SEQ ID NO 111
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 111

ttgaagcttt gggctacgtg gatgaccagc tgttcgtgtt ctatgatgat gagagtcgcc 60

gtgtggagcc ccgaactcca tgggtttcca gtagaatttc 100

<210> SEQ ID NO 112
<211> LENGTH: 100

-continued

<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 112

ggataacctt ggctgtaccc cctggggaag agcagagata tacgtgccag gtggagcacc 60

caggcctgga tcagcccctc attgtgatct gggagccctc 100

<210> SEQ ID NO 113
<211> LENGTH: 100
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 113

ggataacctt ggctgtaccc cctggggaag agcagagata tacgtaccag gtggagcacc 60

caggcctgga tcagcccctc attgtgatct gggagccctc 100

<210> SEQ ID NO 114
<211> LENGTH: 80
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 114

tgaagcactt gaaggagaag gtgtctgcgg gagccgattt catcatcacg cagcttttct 60

ttgaggctga cacattcttc 80

<210> SEQ ID NO 115
<211> LENGTH: 80
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 115

tgaagcactt gaaggagaag gtgtctgcgg gagtcgattt catcatcacg cagcttttct 60

ttgaggctga cacattcttc 80

<210> SEQ ID NO 116
<211> LENGTH: 80
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 116

tccagatgaa gctcccagaa tgccagaggc tgctccccgc gtggcccctg caccagcagc 60

tcctacaccg gcggcccctg 80

<210> SEQ ID NO 117
<211> LENGTH: 80
<212> TYPE: DNA
<213> ORGANISM: Homo sapien

<400> SEQUENCE: 117

tccagatgaa gctcccagaa tgccagaggc tgctcccccc gtggcccctg caccagcagc 60

tcctacaccg gcggcccctg 80

<210> SEQ ID NO 118
<211> LENGTH: 48
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: Hair pin structure

-continued

<400> SEQUENCE: 118

cagagagtac ccctcaaccg tgcatgcatg aaacatgcat gcacggtt 48

What is claimed is:

1. A method for determining whether a polymorphism correlates with suceptibility to morbidity, early mortality, or morbidity and early mortality, comprising;

identifying a polymorphism; and

determining the frequency of the polymorphism with increasing age in a healthy population.

2. The method of claim 1, wherein the polymorphism is identified by detecting the presence of target nucleic acids in a sample by a method, comprising the steps of:

a) hybridizing a first oligonucleotide to the target nucleic acid;

b) hybridizing a second oligonucleotide to an adjacent region of the target nucleic acid;

c) ligating the hybridized oligonucleotides; and

d) detecting hybridized first oligonucleotide by mass spectrometry as an indication of the presence of the target nucleic acid.

3. The method of claim 1, wherein the polymorphism is identified by detecting target nucleic acids in a sample by a method, comprising the steps of:

a) hybridizing a first oligonucleotide to the target nucleic acid and hybridizing a second oligonucleotide to an adjacent region of the target nucleic acid;

b) contacting the hybridized first and second oligonucleotides with a cleavage enzyme to form a cleavage product; and

c) detecting the cleavage product by mass spectrometry as an indication of the presence of the target nucleic acid.

4. The method of claim 3 wherein the samples are from subjects in a healthy database.

5. The method of claim 1, wherein the polymorphism is identified by identifying target nucleic acids in a sample by primer oligo base extension (probe).

6. The method of 5, wherein primer oligo base extension, comprises:

a) obtaining a nucleic acid molecule that contains a target nucleotide;

b) optionally immobilizing the nucleic acid molecule onto a solid support, to produce an immobilized nucleic acid molecule;

c) hybridizing the nucleic acid molecule with a primer oligonucleotide that is complementary to the nucleic acid molecule at a site adjacent to the target nucleotide;

d) contacting the product of step c) with a composition comprising a dideoxynucleoside triphosphate or a 3'-deoxynucleoside triphosphate and a polymerase, so that only a dideoxynucleoside or 3'-deoxynucleoside triphosphate that is complementary to the target nucleotide is extended onto the primer; and

e) detecting the extended primer, thereby identifying the target nucleotide.

7. The method of claim 6, wherein detection of the extended primer is effected by mass spectrometry, comprising:

ionizing and volatizing the product of step d) ; and

detecting the extended primer by mass spectrometry, thereby identifying the target nucleotide.

8. The method of claim 7, wherein;

samples are presented to the mass spectrometer as arrays on chips; and

each sample occupies a volume that is about the size of the laser spot projected by the laser in a mass spectrometer used in matrix-assisted laser desorption/ionization (MALDI) spectrometry.

9. A method for determining a polymorphism that correlates with age, ethnicity or gender, comprising:

identifying a polymorphism; and

determining the frequency of the polymorphism with increasing age, with ethnicity or with gender in a healthy population.

10. The method of claim 1, wherein the polymorphism is identified by a method, comprising:

sorting the database according to a selected parameter to identify samples that match the selected parameter, wherein the database comprises:

datapoints representative of a plurality of healthy organisms from whom biological samples are obtained, wherein each

datapoint is associated with data representative of the organism type and other identifying information.;

isolating a biopolymer from each identified sample;

optionally pooling each isolated biopolymer;

optionally amplifying the amount of biopolymer;

cleaving the pooled biopolymers to produce fragments thereof;

obtaining a mass spectrum of the resulting fragments and comparing the mass spectrum with a control mass spectrum to identify differences between the spectra and thereby identifing any polymorphisms; wherein:

the control mass spectrum is obtained from unsorted samples in the collection or samples sorted according to a different parameter.

11. The method of claim 10, wherein cleaving is effected by contacting the biopolymer with an enzyme.

12. The method of claim 11, wherein the enzyme is selected from the group consisting of nucleotide glycosylase, a nickase and a type IIS restriction enzyme.

13. The method of claim 10, wherein the biopolymer is a nucleic acid or a protein.

14. The method of claim 10, wherein the the mass spectrometric format is selected from among Matrix-Assisted Laser Desorption/Ionization, Time-of-Flight (MALDI-TOF), Electrospray (ES), IR-MALDI, Ion Cyclotron Resonance (ICR), Fourier Transform and combinations thereof.

15. The method of claim 1, wherein the polymorphism is identified by a method, comprising:

obtaining samples of body tissue or fluid from a plurality of organisms;

isolating a biopolymer from each sample;

pooling each isolated biopolymer;

optionally amplifying the amount of biopolymer;

cleaving the pooled biopolymers to produce fragments thereof;

obtaining a mass spectrum of the resulting fragments;

comparing the frequency of each fragment to identify fragments present in amounts lower than the average frequency, thereby identifying any polymorphisms.

16. The method of claim 15, wherein cleaving is effected by contacting the biopolymer with an enzyme.

17. The method of claim 16, wherein the enzyme is selected from the group consisting of nucleotide glycosylase, a nickase and a type IIS restriction enzyme.

18. The method of claim 15, wherein the biopolymer is a nucleic acid or a protein.

19. The method of claim 15, wherein the the mass spectrometric format is selected from among Matrix-Assisted Laser Desorption/Ionization, Time-of-Flight (MALDI-TOF), Electrospray (ES), IR-MALDI, Ion Cyclotron Resonance (ICR), Fourier Transform and combinations thereof.

20. The method of claim 15, wherein the samples are obtained from healthy subjects.

* * * * *